THE IRON AGE

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Plant of the Eastern Car Company, Ltd.

Four Parallel 90-Ft. Spans 1100 Ft. Long Constitute the Main Building—The Equipment Includes an Interesting Power Plant

A large railroad car building plant in which the departments are largely centralized under one main roof has been built at New Glasgow, Nova Scotia. It is the plant of the Eastern Car Company, Ltd., a subsidiary of the Nova Scotia Steel & Coal Company, Ltd., which it adjoins, and it is located on the Intercolonial Railway and the East river, which flows into Northumberland Strait. The main building is 1100 ft. long and consists of four spans each 90 ft. wide, arranged so that the material will travel a comparatively short distance from one department to another. The whole layout is planned with a view to reducing the handling of material to a minimum. River improvements are under way to allow large ocean vessels to land their cargo at the company's docks. Labor conditions are good in this section, and altogether this plant, it is felt, ought to be a strong factor in the car building business of Canada.

The Erecting Shop of the Eastern Car Company

The accompanying general plan shows the buildings and tracks, and exterior and interior views of the main building, including the power house, are here given. The buildings are steel frame with concrete walls. Generous daylight illumination is supplied by numerous windows through the sides and monitors. The monitors also provide for ventilation.

Referring to this general plan, it will be noted that the storage for steel and lumber is at one end of the plant, the north end. From this point material moves toward the south into the shop, from which it emerges in the form of finished cars.

Span 1 contains the machine shop, air brake department, bolt and rivet storage, truck shop and forge department. Span 2 is devoted entirely to the steel car department, the material being successively sheared, punched, pressed, riveted and erected. At the point where the erecting tracks begin they are intersected by a cross track upon which the trucks from the truck-shop are transferred directly to the point where they are needed in the erection shop. The third span is devoted en-

View Showing the General Character of the Buildings Combined Under One Roof

tirely to the wood car department, and contains two erecting tracks. The fourth span has a mezzanine floor running about one-third of its length on which is located the pattern and template shop and the foremen's offices. Under this floor is the general stores department. The rest of this span is taken up with wood working machinery.

All machines so far as possible are individual motor drive, electricity being used wherever possible. Very few air hoists are employed, nearly all of this work being done by electric hoists. Most of the heavy machinery was imported from the United States and the remainder was made in Canada. Three of the four spans are supplied with 10-ton traveling cranes, seven being provided for the three spans; there are two in the wooden car shop, three in the steel car shop and two in the truck and forge shop. These cranes travel the entire length of the building.

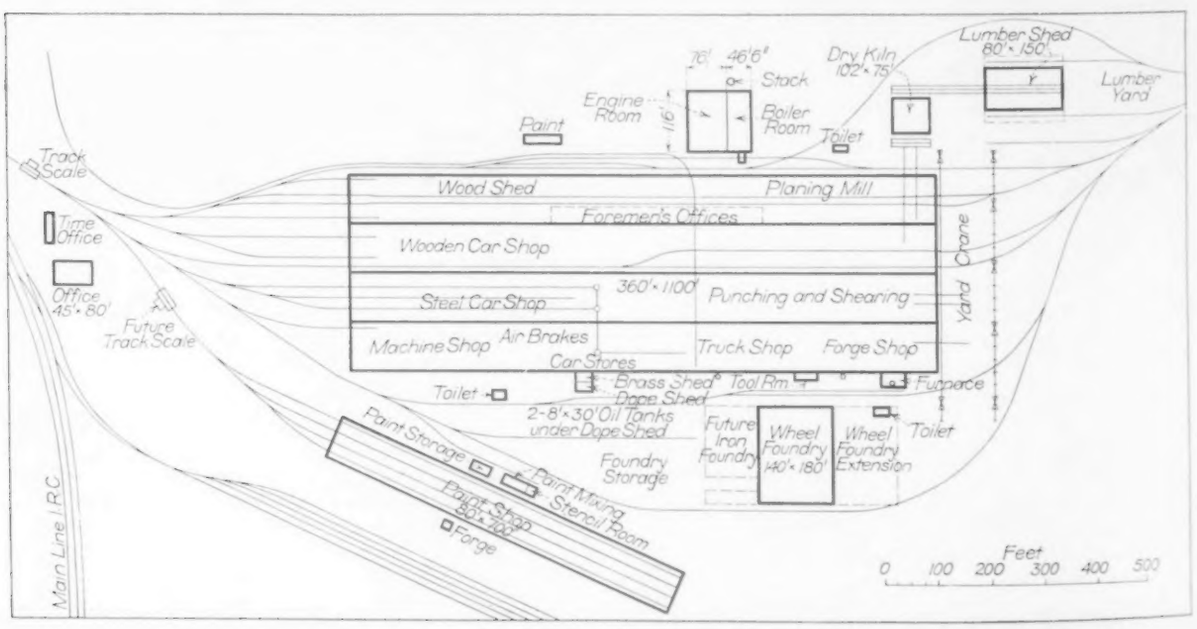
One feature of the plant equipment is four large Thomas spacing tables with Williams White punches arranged to handle all classes of car material. The shears are Hilles & Jones heavy type. The two presses already installed were furnished by R. D. Wood & Co. Most of the machine tools were furnished by John Bertram & Sons Company and the Canada Machinery Corporation.

The wheel foundry is housed under a separate roof and has a capacity of 200 wheels per day. Provision has been made to increase the capacity to 400 wheels per day. It is built on the straight-floor plan with the latest modes for handling both the flasks and the metal. The wheels can be rolled directly from the wheel foundry to the truck shop, a distance of only 60 ft.

Provision has been made for the erection of a paint shop, 700 ft. long, containing four tracks, to house the painting and finishing department. Among the other accessory buildings which go to make up the plant are the following: Power house, dry kiln, lumber storage, general storeroom and paint and oil storage, locomotive house, general office, etc.

The power plant is close to the west side of the main building, midway along its length, as central as possible without being too far from the supply of condensing water. The condensing water is taken from the East river, 1000 ft. away. A pump house is built on the shore of this river, containing three electric driven pumps with remote control so that the operator can start and stop them from the power house without the necessity of going to the pump house except for occasional inspection.

The boiler room is laid out for five 600-hp. Edge Moor water-tube boilers, equipped with Green chain grate stokers, making a total of 3000 hp. at nominal rating. The boilers are guaranteed for a continuous overload of 50 per cent. Three of these boilers have been installed and are now in service. Overhead steel bunkers lined with concrete are provided for coal storage and a continuous conveyor handles the coal from the track hopper to the bins. Provision has also been made at each boiler for burning wood refuse and shavings, the material being han-

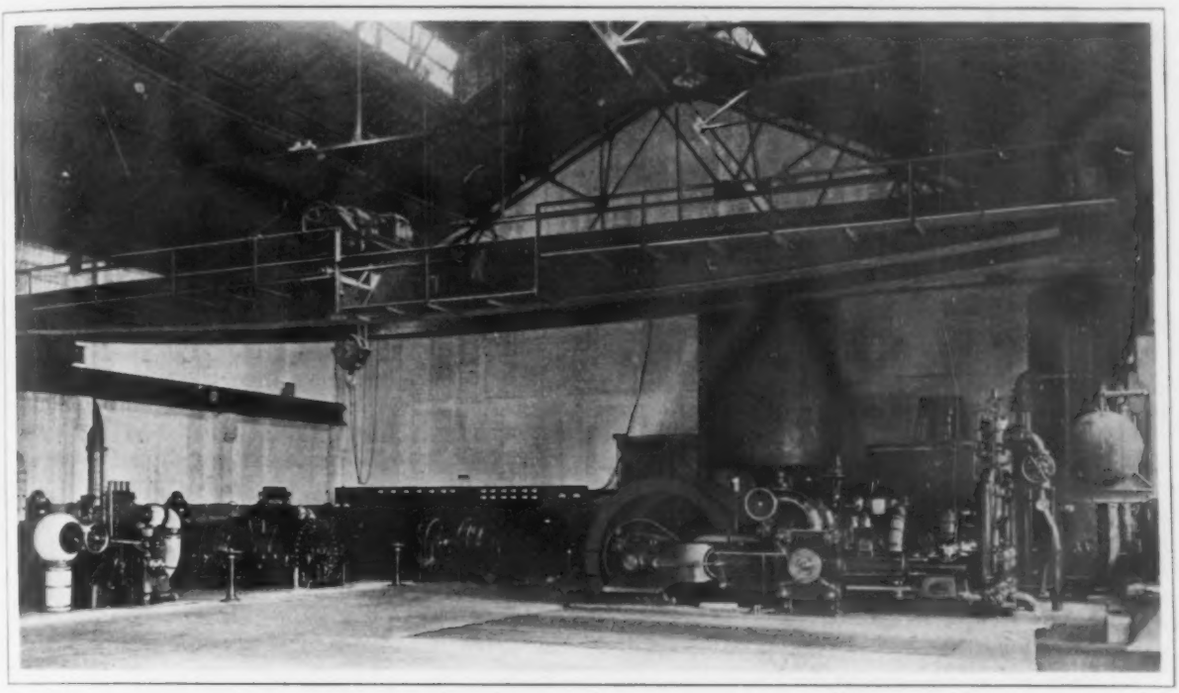


General Plan of the Works of the Eastern Car Company

dled by a blower system which delivers it direct to the boilers. Any boiler can in a few minutes be changed from coal to wood or vice versa, an arrangement which, it is found, gives better results than burning wood and coal together.

Both direct and alternating-current electric power is used. The alternating current is 3-phase at 600 volts and the direct current, which is used on cranes and variable speed motors, is at 220 volts. The electric power plant consists of two 750-kw. turbines furnished by the Canadian General Electric Company and there is provision for a third unit of the same size. A Terry turbine of 125-kw. capacity has been installed to take care of overtime loads, such as night and Sunday lighting, etc. A motor generator set provides the direct current, with both steam driven and electric driven exciters. The switchboard and bus-bar arrangement has been designed particularly to make the plant highly flexible. The main circuits leave the power house in conduits and the whole system of electric connections in the power house is arranged with ample space to afford ready accessibility. The turbines are provided with synchronizing motors and are also controlled by a Tirrill regulator from the switchboard.

One compound two-stage air compressor of 3000 cu. ft. capacity, built by the Canadian Ingersoll-Rand Company, has been installed and provision made for a second unit of the same size. A hydraulic system has also been provided. One three-cylinder compound flywheel high-pressure pump is now in service and a second one is provided for. Two large accumulators are furnished in the power house to take care of fluctuation in this connection.



The Power House of the Eastern Car Company

The Wood Shop of the Eastern Car Company

Piping systems and main cables are carried in conduits and tunnels from the power house to the various parts of the plant. The main tunnel across all four spans of the main building is 7 ft. wide by 6 ft. 6 in. deep, which gives access to this equipment and permits of ready inspection. The heating of the plant is done largely by exhaust steam which is carried in mains through these tunnels to four large heating units consisting of large stacks of indirect radiation, about which air is passed by fans and distributed throughout the shop.

Special mention might be made of the general arrangement of turbines and piping to give the

most economical results for the various conditions which obtain in a car plant. For the summer months there is little demand for exhaust steam except for dry kilns and a mixed pressure turbine has been provided to admit of the utilization of the exhaust steam from reciprocating units for generating electric power during this season. For the winter months a high-pressure turbine has been provided with a bleeder attachment between the high and low-pressure stages, which will permit exhaust steam being extracted to make up any additional steam required on the heating system. During the intermediate months, the mixed-pressure turbine may be used or the high-pressure turbine can be worked as a straight condensing turbine and the exhaust steam from the reciprocating units used for such heating as may be required. Both these turbines are provided with controlling valves which operate automatically to take care of the varying load.

The principal lighting of the plant is done by flaming arc lamps. In the power house and smaller buildings large tungsten lamps are used.

A large modern office building of brick and cement, with hardwood finish, has been erected. The buildings throughout the plant are of a specially substantial type, and practically all material will be stored under cover so that there will be no interruptions by inclement weather.

The plant has been in operation since the latter part of last year. The first contract of 2000 cars for the Grand Trunk railroad has been completed, and an order is now going through for the Intercolonial railroad.

The design and construction of the plant was carried out by Horace H. Lane, consulting engineer, of Detroit, Mich., who had an organization on the ground until the plant was in full operation. The plant was designed and built in sixteen months.

What is known as the New York Business Show and Efficiency Exposition will be held in the Sixty-ninth Regiment Armory, Lexington avenue and Twenty-sixth street, New York City, October 26 to 31. It is to be conducted by the Annual Business Show Company, 150 Nassau street, New York.

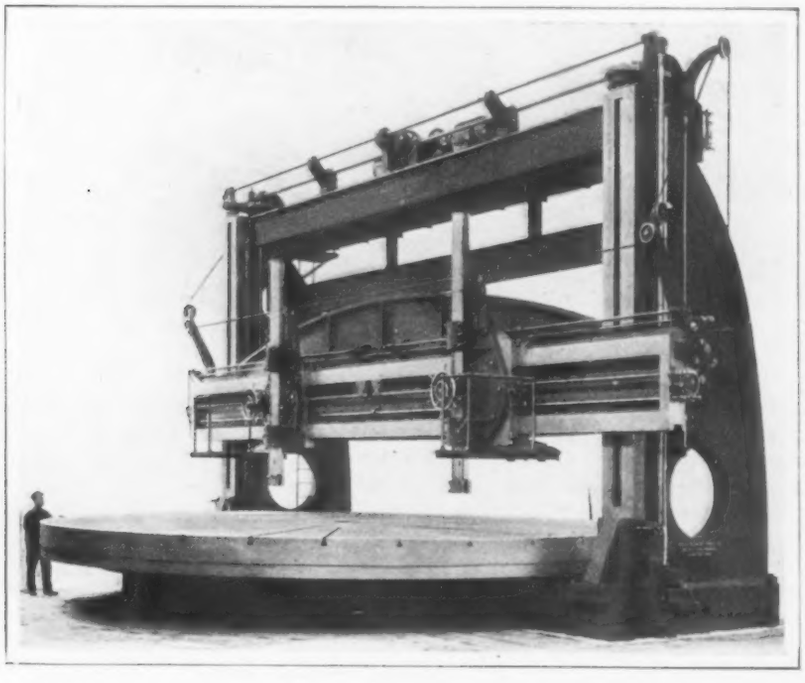
A GIGANTIC BORING MILL

Machine, with 85,000-Lb. Cross Rail and at New York Navy Yard, Largest in the Country

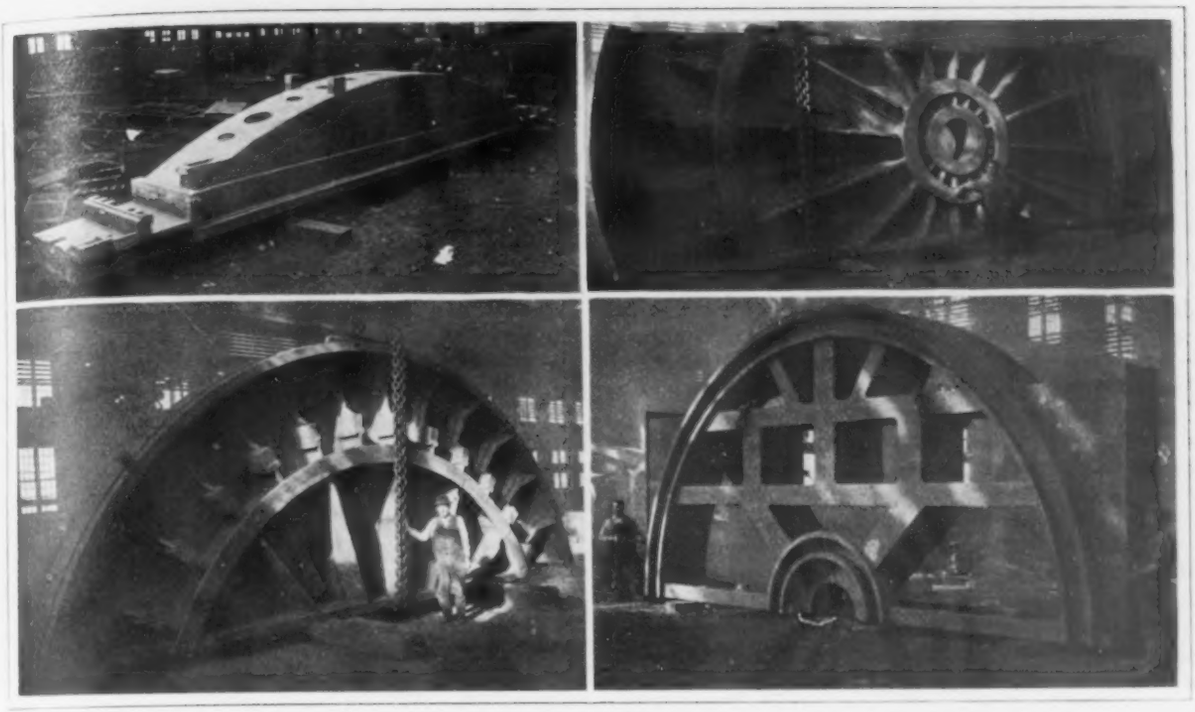
In *The Iron Age* of July 24, 1913, a brief mention was made of the award to the Niles-Bement-Pond Company, New York City, of the contract for a large boring mill. This mill was built at the Niles works of the company, Hamilton, Ohio, and its installation at the New York navy yard has recently been completed. The mill is the largest ever constructed in this country, if not in the world, and has a swing of 36 ft. in diameter and a clear space of 12 ft. under the tools. The principal work for which it will be used is the finishing of the tracks on which the turrets of large war vessels will revolve and for that reason this large swing was required. Other uses to which the mill will be put are the boring of cylinders and the machining of casings of the large steam turbines with which the new vessels of the American navy are equipped. The chief point of interest about this great tool is that the machine is not of the so-called extension type, but is of the standard cross rail type, the actual swing being 2 in. more than that specified, 36 ft., with the housings in a fixed position. The total net weight of the machine, including the driving motors, is over 330 tons, the weight approximating 665,000 lb. A view of the mill is presented in one of the accompanying illustrations, while the other is a group showing some of the large parts entering into its construction.

The table, which measures 34 ft. in diameter, is designed to carry a weight of over 200,000 lb. and the extreme size made it necessary to build it in three parts. The central section of the table which weighs 83,000 lb. is illustrated at the upper right corner of the group engraving, while one of the side sections weighing about 70,000 lb. is shown in the lower left corner, the three sections of the table weighing in the neighborhood of 225,000 lb. Conical rollers running in a circular track, which measures 24 ft. in diameter and is sunk into the bed, support the table. High carbon steel is used for the rollers which are fitted to circular guide frames to keep them in the proper alignment. An annular adjustable bearing ring surrounding the central spindle also supports the table and is adjusted vertically by steel screws. The table tracks and the spindle which are centered in the bed by an adjustable conical bush have forced lubrication from a pump that is operated from the main driving motor. The table drive is through a spur gear 5 ft. in diameter, which is a semi-steel casting. Two forged steel pinions located on opposite sides of the mill mesh with the table driving gear, the teeth of which are cut from the solid metal.

The main portion of the bed is made in two parts, one of which is shown in the lower right corner. This piece weighed 69,000 lb. before finishing and the other portion weighed 48,600 lb. In addition to these two main sections of the bed there are two extensions attached to them. Vertical



The Largest Boring and Turning Mill Ever Built in the United States. It Is Motor Driven, Swings 36 Ft. and Will Be Used for Finishing the Tracks upon Which Warship Turrets Run, Boring Cylinders and Machining Turbine Casings



A Group of Parts of the Large Boring and Turning Mill, Ranging from 69,000 to 85,000 Lb. in Weight

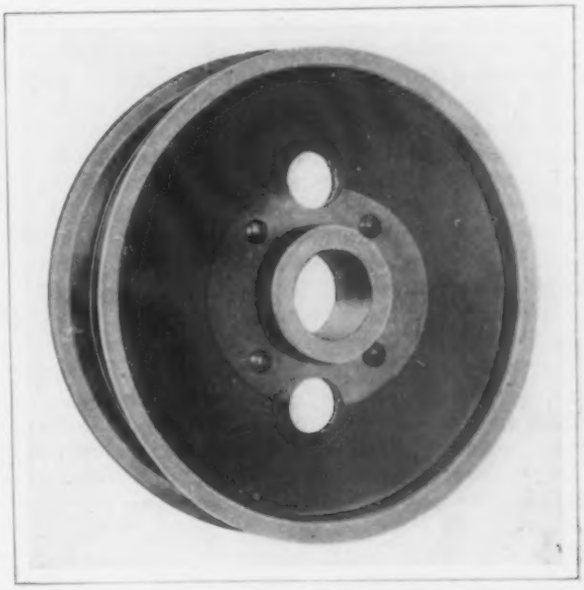
webs of the bed provide a rigid support for the table tracks. The housings, apart from their great weight, 32,000 lb., do not present any particular points of interest and are of the same general type as in the builder's smaller machines. They are box castings of massive construction connected at the top by a heavy cross brace, while a steel girder connecting them is relied upon to increase the rigidity still further.

The cross rail illustrated at the upper left corner is made in two parts, its complete weight being 85,000 lb. before machining. It consists of a box casting 46 ft. long, with a heavy camber beam bolted on top. The combined depth of the cross rail proper and the camber beam is 8 ft. and the function of the latter is to stiffen the cross rail and take up sag due to the weight of the rail and the heads. A 30-hp. motor located on the top cross brace and connected to four large diameter elevating screws working in bronze nuts raises and lowers the rail. Two heads arranged for boring and turning are fitted to the cross rail. These are of the right and left type and are designed so that either can be moved to the center. Graduated swivels with worm gearing are furnished to enable them to be set at any angle on either side of the perpendicular, up to a maximum of 30 deg. Rapid power traverse and a hand movement for close adjustment are provided for the heads, the former being operated by a 10-hp. motor, located on the top brace. These operations and the engagement and disengagement of the feeds are controlled from a platform attached to each head, upon which the operator stands. An interlocking arrangement is provided for the operating levers which is relied upon to prevent the operator on one head from accidentally moving the other, as the rapid power traverse cannot be engaged for one head unless it is disengaged from the opposite one. The boring bars have eight reversible power feeds which are operated in a vertical or angular direction and the feeds for each head are positive and entirely independent of each other. Friction clutches provide a safeguard against breakage of the feed gearing if either the bar or the saddle should by any chance encounter an obstruction.

The machine is driven by a 75-hp. motor and speeds are provided for boring, turning and facing operations.

New Pressed Steel Pulley

The accompanying illustration shows a pressed steel pulley now being manufactured by the Oakes Pressed Steel Company, Indianapolis, Ind. The company states that it has heretofore been found difficult to use pressed steel for the manufacture of pulleys as there was not stock sufficient to cut a keyway. In the pulley here shown this has been overcome by brazing in a piece of tubing and cutting the keyway in the tubing. By substituting pressed steel, the weight of the pulley has not only been greatly reduced but a saving is made in cost of manufacture of 6 to 10 cents per pulley, as no machining is necessary on a pressed steel pulley. Being ready to assemble, a saving in time and equipment is also made which is of interest to the manufacturer. This is one of the new uses of pressed steel in substitution for cast or forged parts.



Pressed Steel Pulley Made by the Oakes Pressed Steel Company, Indianapolis, Ind.

Nozzle Brick for Steel Foundry Ladles*

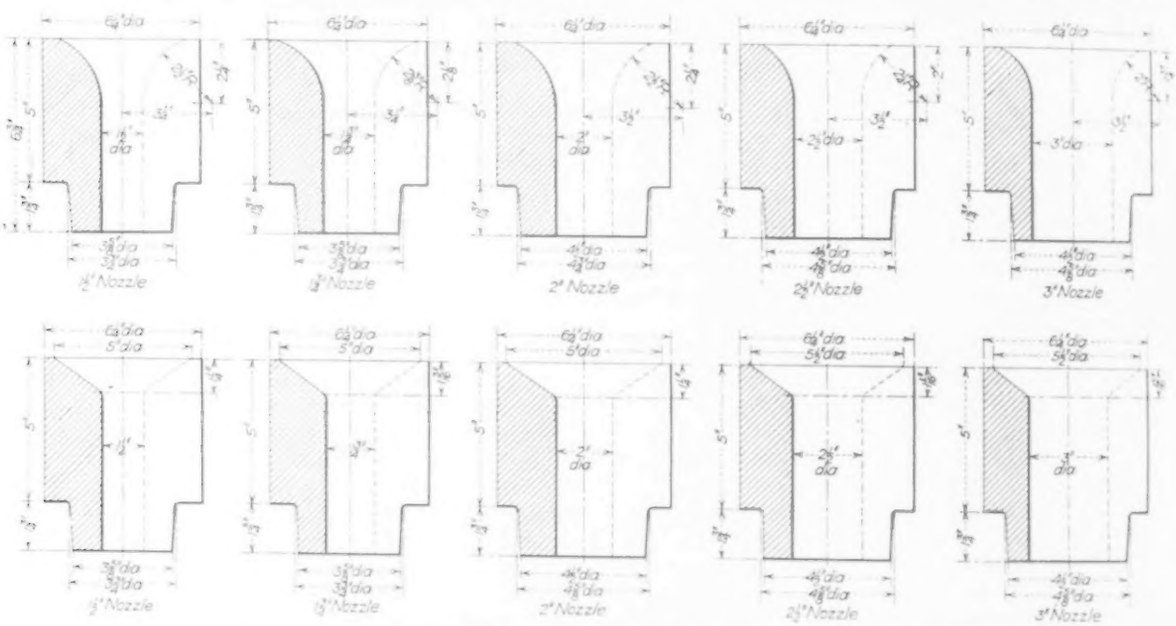
Standards Proposed by a Committee of the American Foundrymen's Association—Variations in Size Used in Numbers of Foundries

Your committee appointed to investigate the possibilities of standardization of features of steel foundry practice has been engaged the past year in the investigation of the possibility of standardizing nozzle brick in connection with ladle equipment. As a result of Mr. Bull's paper on trouble encountered in pouring steel castings, which was read at our last convention, it was decided to go into the matter of standardization of nozzle brick with the idea of cutting down the very great number of different designs that the brick people are now required to supply in small quantities and in so doing make it possible for them to improve the quality of the brick by large scale production. Your committee has found that the brick people will welcome any move on our part in the way of standardization, as the nozzle business for the steel foundries forms only a very small percentage of their total business.

Your committee suggests that the standard nozzle design submitted herewith be given at least a fair trial by all of the members of this association. Certain results in certain foundries are supposed to come from certain peculiar shapes, sizes and angles and radii in connection with the nozzle. It is the opinion of your committee that in a great many cases this is merely a matter of sentiment and that once a standard design has been given a fair trial satisfactory results will be obtained.

In compiling the standard your committee got in touch with 42 of the principal steel foundries of this country. All of the big manufacturers of steel castings are represented, and while the nozzle decided on by the committee does not represent the exact average of all of the dimensions received, there have been few radical departures from the average, the aim of the committee being, of course, to decide on a design that would be most easily adopted by all. There appears to be an equal division of opinion in regard to the relative desirability of the round face and straight face nozzle. This being the case your committee recommends that two general designs of nozzle be decided on as the association standard, one having the round face and the other the straight face.

Your committee recommends that five sizes of nozzle be decided on for each of the general designs, the sizes to be as follows: 1½, 1¾, 2, 2½ and 3 in. diameter of hole. The outside diameter of the smallest size nozzles might appear to some to be a little bit too large, but it was decided that it would be best to keep this dimension constant for all sizes of nozzles, and this decision was reached because we believe that it would be good policy to make the dimension of the brick generous, on account of the importance of its work. When it is realized that the successful casting of 20 tons of metal or over depends upon the capability of a small clay brick to stand up under a severe temperature, as well as under hard mechanical usage, the wisdom of this decision can be realized.



The Proposed Five Standard Round Face and the Five Straight Face Nozzles

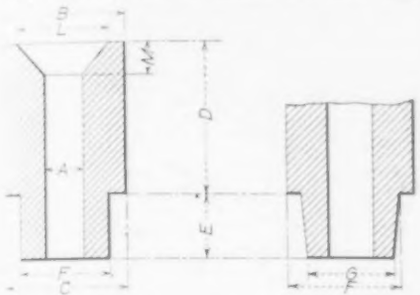
It has been recommended by your committee that certain specifications should be drawn up relative to the degree of hardness constituency of the clay for the temperature that the standard nozzle must withstand, in order to meet requirements of steel foundries. Your committee, upon investigation, finds that it is impossible to tell what degree of hardness has been obtained in baking, other than that testing with a blunt instrument by hand will indicate hardness. The constituency of the clay cannot be determined by analysis, and each manufacturer must decide for himself what kind of clay will be satisfactory for his purpose.

It is the opinion of your committee that brick makers should distinctly understand that this standardization is of particular interest to the steel foundrymen only. They should be made to realize that because a particular product gives satisfaction

*Committee report, substantially in full, presented before the recent meeting of the American Foundrymen's Association.

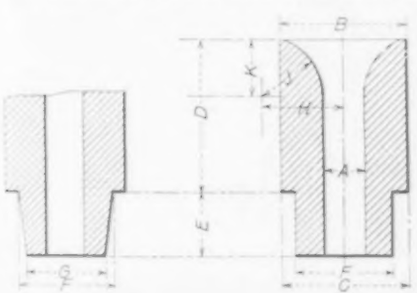
in rolling mill ingot practice is no criterion of its usefulness in the steel foundry, where the most severe service is encountered.

Attached to this report are results of the canvass of all the principal steel foundries of this country, following which is included two sheets, one showing the five standard sizes of round face nozzles and the other showing five standard sizes of straight face nozzles. Blue prints of these will be forwarded to all the brick makers who make nozzles, with the statement that they represent the standard nozzle as decided by the American Foundrymen's Association committee, and with request that they prepare molds in the anticipation of orders on nozzles of these designs. It is obvious that the success of this scheme depends on the co-operation of all of the members of this association, and it is earnestly hoped by the committee that their efforts will be appreciated by the other members of the association to the extent of giving the standard nozzle as decided on by the committee a thorough try-out, with the idea of adopting it, should no troubles be encountered with respect to design.



Name of Foundry	Dimensions in Inches								
	A	B	C	D	E	F	G	L	M
Wellman Seaver Morgan	2	5½	5	5	1	4	4	4½	⅜
Union Steel	2½	5¾	4⅞	4½	1½	3⅞	3⅝	4½	⅜
National Malleable	2⅜	6	5⅞	5¾	1⅞	4⅞	3⅞	5⅝	1⅛
" "		5⅛	4⅛	3⅞	1½	3	2½	5⅛	1⅛
" "		5¾	5	4½	1½	3¾	3¼	5¼	1½
American Bridge	3	5½	5⅛	5¾	1½	4	4	4½	1
" "	2	5¼	5⅛	6¼	1½	4	3	4½	1½
Columbia Steel	2	5¾	5⅛	5	1¾	4⅛	4⅛	4½	¾
Hubbard Steel	2½	6	5⅞	6⅞	3	4½	4½	4⅝	¾
Seaboard Steel	2⅜	5⅝	5½	4⅞	2	3¾	3⅜	3¾	¾
Wheeling Mold	3	5⅛	5⅛	7	2¾	4½	4½	5⅜	1¾
Baird Steel		6	6	4	2	5	5	4	¾
" "		6	6	4¾	2	4¾	4¾	3⅝	¾
Allegheny Steel	2	6	6	7	4	4½	4½	4⅝	1½
Detroit Steel	3⅜	5⅝	5¾	6¾	2	3¾	3¾	4⅜	1⅛
National Foundry	2	5½	5½	4½	3	3¾	3¾	4½	1
Ohio Steel	1¾	5¾	5¾	7	1⅞	4½	4½	4⅜	
" "	3	5¾	5¾	7	1⅞	4½	4½	5	
Penn Steel Castings	2	4⅞	4⅞	3⅜	2⅜	3¾	3¾	2⅜	¾
" " "	2½	6¾	6¾	4¾	2	4¾	4¾	3½	2⅝
Penn Steel	2½	7	7	4	1⅜	4¾	4¾	6	¾
St Louis Steel	1½	5⅜	5⅜	4⅜	1½	4⅜	2⅜	4½	1½
Strong Steel	1½	5¼	5¼	4½	2⅜	3½	3	4½	1⅛
American Steel Foundries	2	5⅛	4⅞	7	1¾	3⅜	3⅜	4⅜	1⅛
Bettendorf Co.	1¾	5¾	5¾	6¾	2½	3¾	3¾	4¾	1⅛
Average	2⅛	5⅜	5⅛	5⅛	2	4	3⅞	4⅛	1⅛

Sizes of Two Forms of Nozzles Used by Steel Foundries



Name of Foundry	Dimensions in Inches									
	A	B	C	D	E	F	G	H	J	K
Birdsboro Steel	2½	5⅜	5⅜	4¾	2¼	4½	4⅝	2½	1¼	1¼
" "	3	5⅜	5⅜	4¾	2½	4⅝	4¾	2¾	1¼	1¼
Bucyrus Steel	2	7	6½	4	1⅜	4⅜	4	3	2	2
Cleveland Steel	2	6½	5¾	5¾	2	4¾	4½	3½	2⅜	2⅜
Chester Steel	2	5⅝	4⅜	4⅜	1⅜	4	3⅝	2½	1½	1½
General Electric	2	5½	4½	4	1½	3⅜	3½	3⅛	2⅛	2⅛
" "	2	5½	5	4	1½	3⅜	3⅜	3⅛	2½	2½
Monarch Steel	1½	5¾	4⅜	5	1½	3½	3¼	3	2½	2⅜
A.J. Haws and Sons	2	4¾	4½	4	1¾	3¼	2¾	1¾	1⅛	1⅛
Duquesne Steel	1⅜	5	5	4	2½	3⅜	3⅜	3⅜	3⅜	3¼
Jones and Laughlin	1½	5⅜	5⅜	8½	1¾	4⅛	4⅛	2½	2	2⅛
" " "	2½	5⅜	5⅜	8½	1¾	4⅛	4⅛	2⅜	2	2⅛
Lawrence Steel	1⅜	4¾	4¾	4	1¾	3¾	3	3⅜	2½	2⅜
McConway & Torley	2	4¾	4⅜	7	1½	3⅜	2⅞	3⅜	2	1⅜
Mesta Machine	2½	5¼	5¼	5¼	1¾	4⅜	4⅛	2	⅜	⅜
" "	3½	6¼	6¼	5½	1¾	4⅛	4⅛	2½	⅜	⅜
Fort Pitt Foundry	3	5¼	5¼	5	1½	4½	4¾	2½	1	1⅛
Commonwealth Steel	2½	5⅜	5⅜	6¾	1½	3½	3⅜	2⅜	1	1¼
Scullin Gallagher	2	6	6	5½	1⅜	3¾	3	3⅜	2¼	2¼
National Steel	2	4¾	4¾	4⅜	1½	3⅜	2½	3½	2½	2½
Buckeye Steel	1⅜	6¾	6¾	5¾	1⅜	3¾	3⅜	3⅜	2⅜	2⅜
Falk Co.	2½	5¼	5¼	3⅜	1⅛	4	4			
" "	2	4½	4½	3½	1⅛	3⅜	3			
American Steel Foundries	2	6¼	6¼	4⅜	2	4⅜	4½	3½	2½	2½
Pittsburgh Steel	3	5⅜	5⅜	4½	1⅛	3⅜	3⅜	3	1½	1⅜
Rome Steel	1⅜	6	6	4	1⅜	3¾	3	3	1⅜	1⅜
Ohio Steel	2½	6	5	4⅜	2	4½	4¾			
Average	2⅛	5⅜	5⅜	5	1⅜	3⅝	3⅜	2⅜	1⅜	1⅜

Sizes of Two Forms of Nozzles Used by Steel Foundries

Device for Regulating Tapered Bushings

The Stow Mfg. Company, Binghamton, N. Y., is using in the motor cases of its electric center grinders a new adjustable bearing on which a patent has been allowed to C. F. Hotchkiss, president of the company. The new bearing, which is of the split, tapered-bushing type, has been thoroughly tried out and it has been demonstrated that the troubles to which such bushings have been subject have been eliminated.

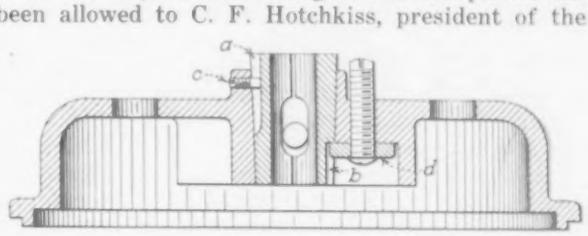


Fig. 1

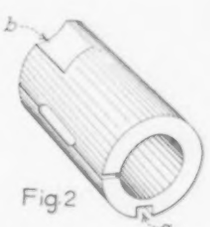


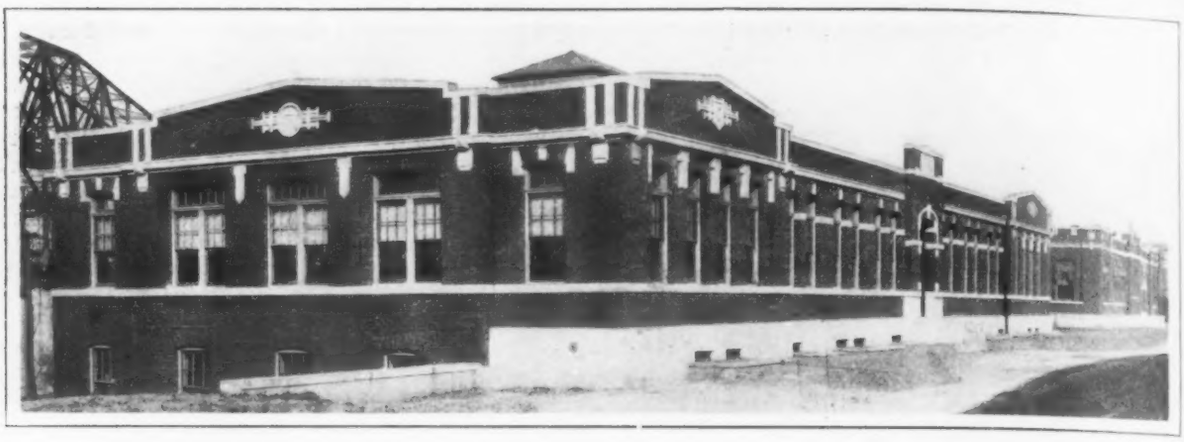
Fig. 2

Fig. 3

Tapered Bushing, Regulating Screw and their Assembly to Maintain a Permanent Running Fit Between Shaft and Bearing of Stow Electric Center Grinder

As illustrated in the accompanying drawings, the split bushing, Fig. 2, which is of bronze, has a shoulder, b, milled at one end, a keyway, a, and provision for an oil wick. The bushing is assembled in the bracket of the motor case, as shown in Fig. 1, and adjusted until a running fit is obtained between the shaft and the bearing. The set screw, c, impinging in the keyway, then serves to hold the bearing in position under ordinary service conditions. To prevent the bearing from being driven in and tightening on the shaft the limiting screw, Fig. 3, and the washer, d, are provided. The washer fits against the shoulder, b, of the bushing and when once adjusted prevents the bearing from moving inward.

A new hardening material for the surface of concrete floors, described by the Chemical Trade Journal, England, contains 95 per cent. of iron dust. It is added to the dry cement in the proportion of 15 to 25 lb. to each 100 lb. of cement. One part of the mixture is used with two parts of sand. This preparation is applied as a top coat of a thickness of ½ to 1 in. It forms a hard and durable floor, claimed to be waterproof and not slippery.



A Modern Steel Works Laboratory

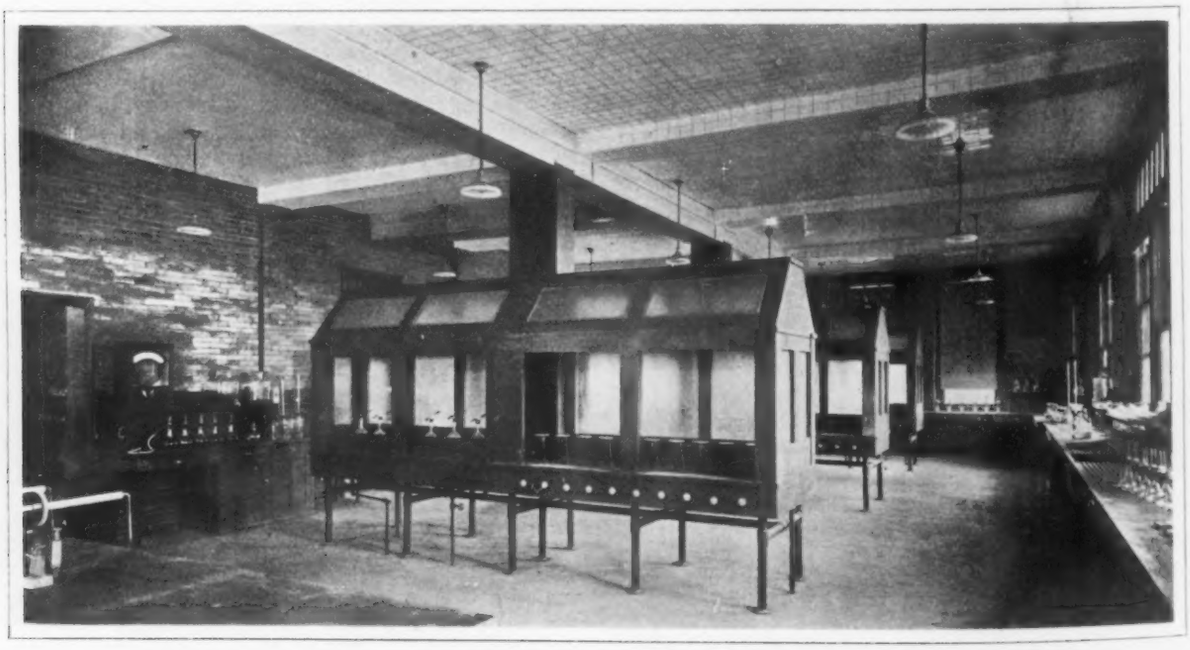
The Bethlehem Steel Company's New Chemical and Physical Department a Unique Model as to Design and Equipment

The Bethlehem Steel Company recently has completed and commenced the operation of a thoroughly modern and newly equipped general chemical and physical laboratory. A description of this building should prove of interest to the iron and steel trade, inasmuch as it exhibits various unique features, and as a whole is believed to be the finest steel works laboratory in the country. The aim has been not only to provide suitable quarters for the efficient handling of the work required, but a building architecturally beautiful and distinctive in its appointments. Further, it should be said that the designers have profited from a study of the good features of certain other laboratories. It is located at South Bethlehem, Pa.

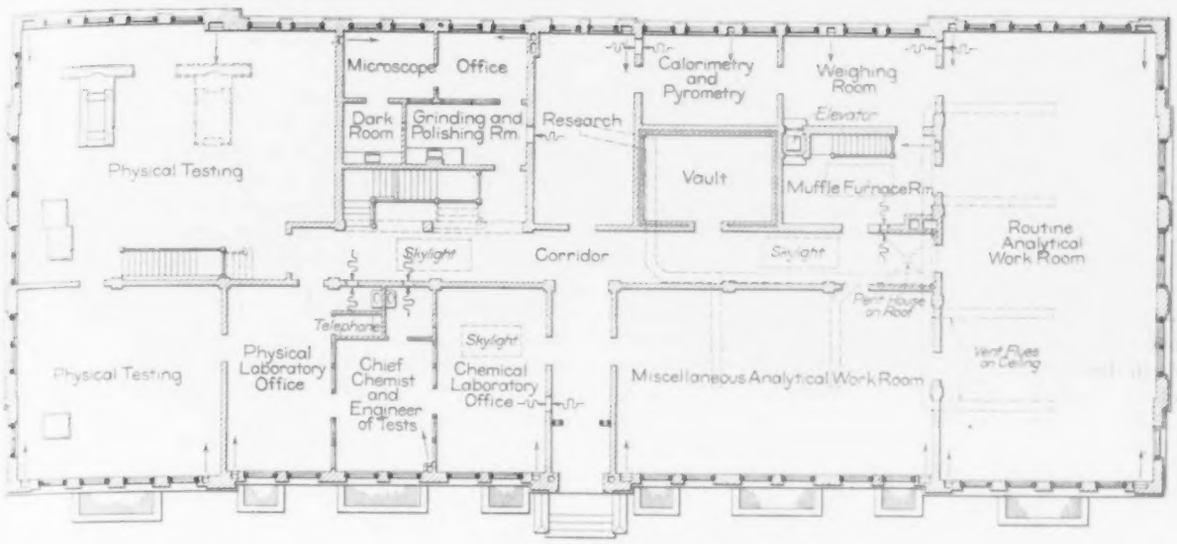
The chemical, physical and metallographic laboratories, also equipment for preparation of raw material samples, have been assembled in the one building, an arrangement which promises entire success in its compactness and facility of operation. The building is logically situated in the east end of the main plant, Lehigh, and a short distance west of the Saucon plant; also in close proximity to the principal point of entry of raw materials into both plants and to the stock yards. In this connection it may be noted that the policy of the company is to maintain suitable branch chemical laboratories to serve at close range the open-hearth plants and new electric furnaces.

DESCRIPTION OF THE BUILDING

The general appearance and interior room arrangement will be evident from the photographs and plan drawings of the two floors. Situated on a short but steep hillside, the building fronts on the street side with a one-story exposure, the main floor being about three feet above street level. On the works side there is a full two-story frontage. The corresponding parts of the walls on opposite sides and ends are exactly similar. By thus taking advantage of the contour, an admirable general system for handling the work was obtained. Large samples for testing are brought in from the works side, prepared in the basement and the final samples are then transferred to the main floor, where practically all the actual testing is done.



Typical Interior View of the Routine Workroom



General Plan of the Main Floor of the New Laboratory of the Bethlehem Steel Company

A handsome grade of red brick has been employed for outside facing, the trimmings being of white, cut, cast stone. The outer walls are carried up about three feet above the roof level. The interior walls of all work rooms on the main floor are faced with three shades of salt glazed brick, closely laid, the colors being progressively varied from a dark brown at the bottom to a light buff extending from a hight of six feet upward. Special shape brick were used for window casements, floor lines and so forth. The ceiling of the main floor is laid with white tile. Hard wood is used for the flooring in all the work rooms and offices, and terrazza in the corridors. The entire basement floor is finished with smooth cement, numerous drains being provided so that a hose may be used for washing out when desired. The walls and ceiling of the basement, vaults and the offices on the main floor are finished with a special grade of fine, white sand cement, which is washable.

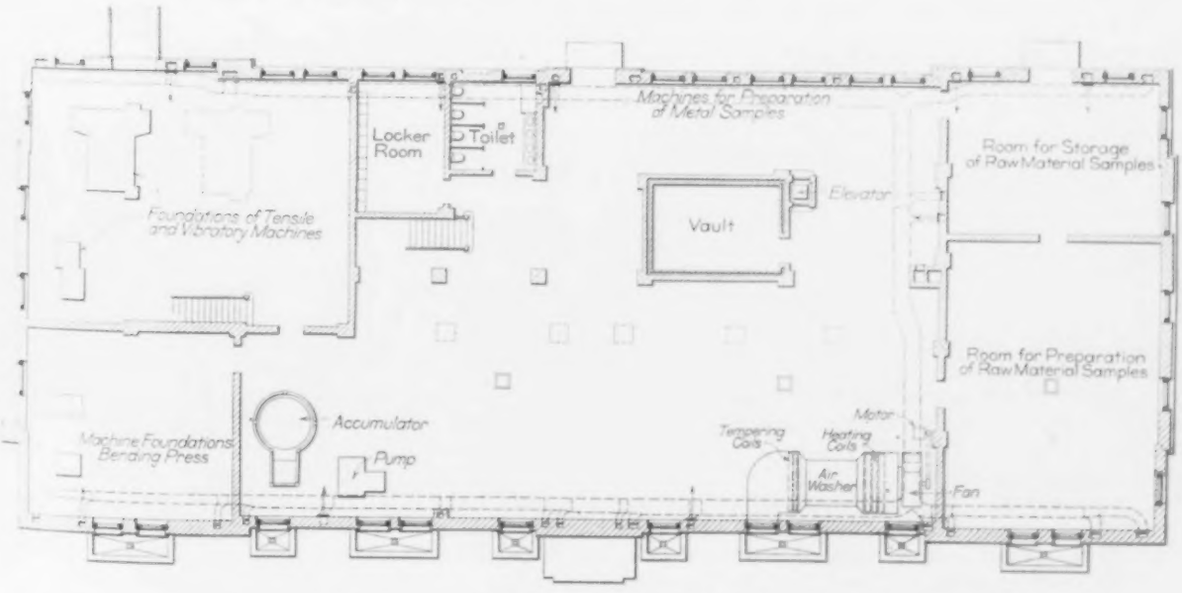
Both the main floor and roof are supported by heavy steel girders and reinforced concrete slabs. A reinforced fireproofing mixture was used under the concrete in constructing both the main floor and the roof, and the slag and tar roofing was adopted. There is a net clearance of approximately 12 ft. between floor and ceiling on both floors.

INTERIOR ARRANGEMENT, FIXTURES AND EQUIPMENT

The chemical laboratory occupies one end of the building, and the physical laboratory the other. There is a skylight near each end of the main corridor, and one above the only interior working room. Both by day and night the light is admirable in all parts of the building. On the main floor the white tile ceiling reflects uniformly by night the light from the electric chandeliers. The buff brick tone down the light to the proper degree for the men, who work facing the walls for a considerable part of their time.

Three interior stairways and three outer doors in the basement render communication from the works to any part of the building very convenient. Two vaults, one directly above the other, provide ample storage facilities, the one on the main floor being used entirely for records, the one in the basement for chemical reagents and miscellaneous apparatus.

A heating plant in the basement washes, heats to a fixed temperature, and delivers the air into a duct following the outer wall, below the floor level, around the whole building. Smaller vertical ducts transfer the warm, ventilating air through registers suitably disposed above both floors. The motor-



General Plan of the Basement of the New Laboratory of the Bethlehem Steel Company

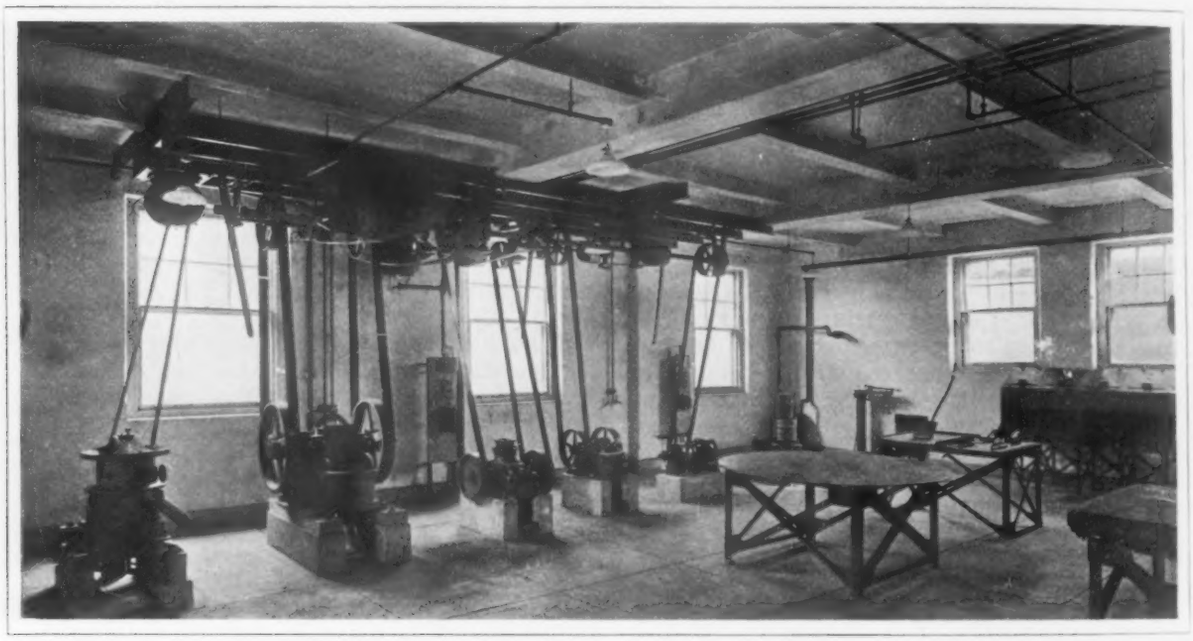
driven fan will deliver a volume of air equal to that of the building in about 15 minutes. So far as practicable, piping is carried on hangers just below the basement ceiling; a different colored pipe for each variety of fluid used makes it easy to follow a lead. When necessary to bury pipe lines under the basement floor cover plates were provided. Sewers of generous size for waste steam and water were installed, terra cotta being used for drains carrying waste acids.

Practically all of the machinery is direct motor driven, a line shaft being used in only one case. There are no wooden cupboards in the building, except in the chemical laboratory work rooms, new steel cupboards, bins, racks, tool and clothes lockers having been substituted. Steel work benches with wood tops are used for heavy work. Provisions for the convenience of all employees are: A drinking fountain of cold spring water near both ends of the building on each floor, a locker room in the basement, and adjacent toilet with hot and cold water.

A general discussion of the arrangement of rooms, with regard to size, relation to each other and the work to be performed in each is not within the province of this article. An examination of the reproduction of the general plans will give some idea as to the scope and distribution of work evolved. It may be stated that the disposition and character of equipment, as planned and installed, have insured the execution of routine work with all due economy of time and effort. A description of a few of the more unique features in each laboratory will be of interest.

All of the hoods are in the middle portion of the rooms, and are supported on iron pipe pedestals. A middle partition and roof of reinforced glass admits all the light necessary, day or night. A central flue of Alberene stone, rising from the floor of each hood, communicates with a general overhead lead lined duct leading to a 3-ft. motor-driven fan, situated in a pent house on the roof. Each hood flue is provided with a main internal damper and smaller external dampers, all of lead, opening into each section of the hood. Fumes are seldom noticeable in the building. Sand and water baths, steam heated by means of copper coils, also of Alberene stone, are constructed inside the hoods.

No pipes are visible above the working surface of either hoods or desks. The various pipes are conducted around the walls immediately under the work desks; short nipples extend through and are surmounted by a standard petcock marked "gas," "blast" or "suction." Gas burners in the hoods are controlled by means of valve wheels on the outside of the base boards, with connecting rods attached to individual petcocks under the floors of the hoods.



Room for Preparing Samples of Raw Materials

THE CHEMICAL LABORATORY

The entire working surface of hoods, work desks, shelves, etc., consists of Alberene stone, which, due to its non-splitting or non-flaking qualities and because it can be readily drilled and sawed into any shape, is highly desirable for laboratory use. The work desks have a single drawer underneath the top and a very few cupboards which are symmetrically disposed about the rooms. With the large storage vault only a small amount of extra apparatus and reagents is necessary in the work room. Thus the accumulation of junk is prevented, and sanitary and orderly quarters maintained.

One large three-unit gas muffle furnace is in constant operation.

A balance room is maintained for certain routine weighing, for distribution of incoming tests and for segregation of analytical results. The policy here, though, as in other large laboratories, is to distribute the balances to the most convenient points in the various work rooms. One entire room has been reserved for special lines of research work. Reagent and stock bottles have been reduced to a few standard types, which insures an orderly appearance. A dumb waiter affords an easy and rapid method for transferring samples, apparatus and reagents to or from the basement.

Among the new electrical equipment may be mentioned a complete installation of alternating current furnaces for carbon combustion determinations, muffle furnaces, drying ovens and hot plates, also a large electrolytic cabinet constructed of Alberene stone. In the basement is a gas melting furnace capable of handling a 60-lb. crucible.

The usual equipment for preparing metal samples for analysis, including a pneumatic hammer for hard metal crushing, drill presses, lathe, etc., is to be found in the basement. The room for the

preparation of ore, limestone, coal and coke samples, etc., is fitted with double, dust-proof doors and is provided with a suction vent leading to the fan on top of the building. The equipment is practically all new and comprises the following apparatus, being nearly ideal for this plant in which a considerable variety of raw materials are used, especially hard ores:

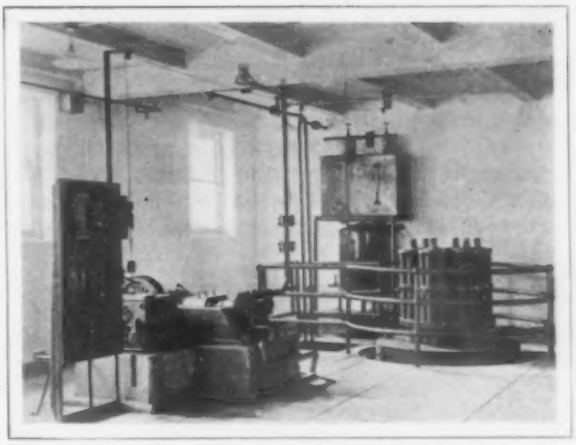
One 6-in. x 8-in. jaw crusher.
One 4-in. x 6-in. jaw crusher.
One grinding roll.
One coal and coke grinder.
One planetary pulverizer for fine grinding.
One mechanical sieve testing machine.
One forged and hardened nickel chrome steel bucking board.
One 6-ft. circular steel sampling table.
One 5-ft. x 7-ft. steam drying table.
Set of closed steel sample bins.

THE PHYSICAL LABORATORY

Three of the testing machines, including a 300,000-lb. Emery, a 400,000-lb. Riehle and a 50-ton Bethlehem bending press are hydraulic machines, a light engine oil being the hydraulic fluid used. They are operated by one Bethlehem three-plunger motor-driven pump in the basement, working through an accumulator with a 6-ft. stroke, the working pressure being 3000 lb. per sq. in. With special valve control, these machines work very satisfactorily. It is interesting to note the operation of two or three simultaneously with practically no sound, save the breaking of the test bars and the occasional running of the pump. A 200,000-lb. motor-driven Olsen tensile testing machine and two vibratory machines are among the other equipment, the two latter and the bending press being located in the basement. Sufficient space has been reserved in each of the testing rooms on the main floor for another large machine. All test bars which require machining are prepared in the various shops and delivered ready for testing.

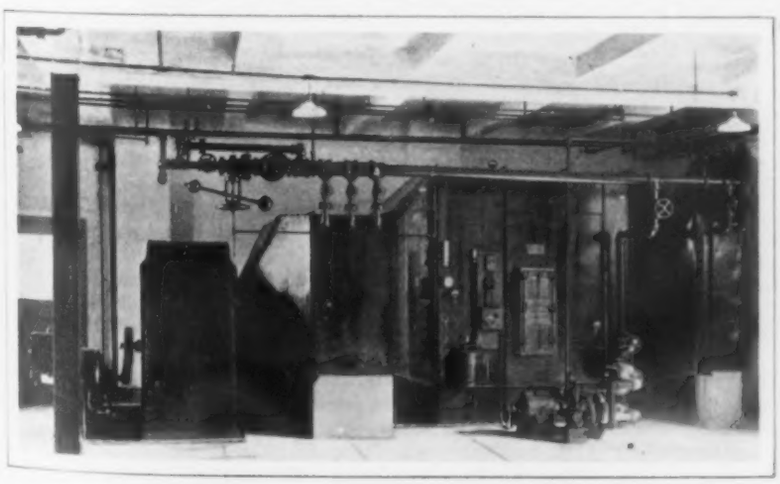
The metallographic laboratory is equipped with thoroughly up-to-date apparatus, including a dark room for development of plates, etc. It is an important feature of a modern laboratory and no pains have been spared to make this one complete in every respect.

The grounds about the building, according to the custom throughout the two plants of the company, wherever possible, are in the process of being beautified by grading, sodding and flower planting. In this connection it may be noted that the architectural design of the army and navy inspection building, described in *The Iron Age*, September 11, 1913, adjacent to the new laboratory building is along the same lines as the latter. The landscape gardening around this part of the plant will embrace the surroundings of both buildings and the approach to a new bridge now under course of construction across the Lehigh River.



Oil Filter, Bethlehem Pump and Accumulator for Operating Hydraulic Testing Machines

In conclusion, it may be stated that it would appear that the rate of depreciation of the building will be low; the equipment is sufficiently extensive and flexible to perform considerable increased service due to plant extension, and the building itself has been designed to carry another story, if it may be desired later.



Combined Air Washer, Heater and Fan for Heating and Ventilating System

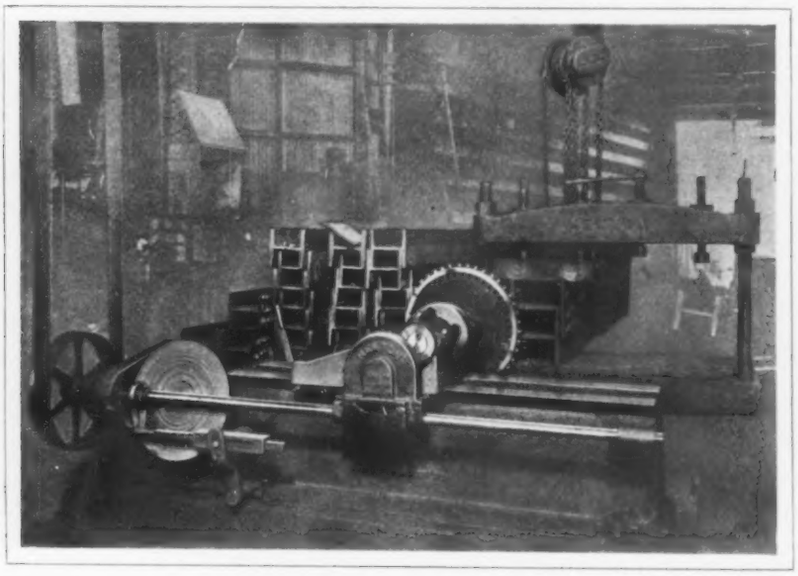
Melting Ferromanganese

In providing molten ferromanganese for use in making steel it is customary to maintain a continuous supply in a molten condition in an electric furnace withdrawing from time to time what is needed and adding a corresponding quantity of the cold alloy to the bath of the electric furnace. This method, however, presents certain difficulties especially in furnaces of the electrode type. The high temperature of the arc tends to volatilize the manganese and thus cause a loss. As a result a lower voltage is used than in making steel, as for example 70 volts or less as against 100 for steel making. This, however, involves an increased cost of electrical installation. Variations in current are also caused when tapping or when adding the cold ferromanganese.

A patent (1,101,551—June 30, 1914) has been granted to Ernest Humbert, Chicago, Ill., for a process of melting which claims to overcome these difficulties. According to the patent, in starting the furnace the ferromanganese is charged either cold or preheated and on top of this a layer of coke, nut size, is applied, two or three inches thick. For a furnace melting about 10 tons of alloy a day about a wheelbarrow of coke is needed. A little slag, in the shape of lime and sand or fluorspar, is added in order to flux the impurities of the coke, chiefly sulphur, about 150 lb. being necessary every 24 hours. The electrodes being in contact with the coke the furnace is working on resistance with small arcs between the pieces of coke and thus as high a voltage can be used as in making steel without producing substantial variations in the quantity of current or danger of short circuits. It is claimed also that the banks and roof of the furnace do not deteriorate as rapidly as otherwise. The saving of copper in conductors and transformers is also important. The process is said to be particularly advantageous where electric furnaces of the Heroult type are used. The claim is made that the method is especially economical.

Long Use of a Structural Shop Machine

Barber & Ross, Washington, D. C., who operate a structural steel plant, have been using for 19 years the combination cold metal saw shown in the accompanying illustration. This machine is one of the products of the Newton Machine Tool Works, Inc., Philadelphia, and is its No. 2 combination. Barber & Ross fabricate material for buildings



Combination Cold Saw in Use by Barber & Ross, Washington, D. C., for 19 Years

exclusively, and their plant is capable of producing 10,000 tons yearly. The general manager of the plant, Harry Blake, states that this combination machine, equipped with a cutter head as illustrated, has finished all columns turned out by the plant, and 20 hours' daily operation has been rather the rule than the exception.

The Newton Works states that on account of the rotary planing machine feature this size of combination saw is the one usually selected by structural shops until the increase in the number of columns handled compels the use of a separate rotary planing machine. Such a machine, of course, will produce more rapidly, but does not have the metal sawing feature. The combination machine uses arch clamps to hold beams in a vertical position. The clamps are attached to a table having a number of slots so that the clamps can be used in any slot and swiveled to any angle.

An Under-Water Coal Storage

A complete and extensive coal storage system is one of the features of the zinc smelter at Hillsboro, Ill., of the American Zinc & Smelting Company. Part of this comprehends an under-water storage and for this purpose a natural ravine was dammed, so that an area of 4½ acres is covered, affording a storage depth of about 30 ft. The coal cars are run out on a 80-ft. steel girder bridge and dumped into that portion of the reservoir adjacent to the pumping station of the plant. Coal intended for immediate use as received, is, of course, delivered to hoppers alongside of the producers. In connection with the under-water storage system, however, coal received as stated is sucked up by means of a centrifugal pump and distributed through pipe lines to the part of the reservoir desired. These pipe lines are supported on floating trusses. In removing the coal from the reservoir for use, it is pumped out, lifted into cars and transported to the smelter. At present about 20,000 tons of coal are stored in the manner described. Besides the convenience, the under-water storage has proved satisfactory in a reduction of the losses due to oxidation in weathering.

Extensive Plant Seeking New Field

An example of the many new alignments in trade and manufacturing which are caused directly or indirectly by the European war is a departure made by the American Machine & Foundry Company, Brooklyn, N. Y., which is seeking opportunities for the execution of high-class special machine work, automatic and semi-automatic machines, either complete machines or parts. The company has an extensive plant where it builds all the patented machinery used by the International Cigar Machinery Company, the Standard Tobacco Stemmer Company and the Automatic Packing & Labeling Company, also machines on which it holds patents for making tobacco products.

The building of intricate machinery has made it necessary for the company to assemble an organization of high character, including inventors, designers and skilled mechanics. Emphasis has been laid on the interchangeability of the parts in the machines which it constructs. In speaking of this point, B. T. Burchardi, vice-president of the company, said recently:

"If a shop force has been trained to work to close limits and made to realize that no variance from the required accuracy is permitted under any circumstances, it would be almost fatal to place it on work where accuracy is not essential, with the idea that the former precision could be easily resumed at will. As a matter of fact, in connection with our shop, I should consider it necessary to dispose of a force so used and assemble an entirely new one. It has taken us 15 years to reach our present standard of accuracy and this has only been accomplished by our one desire to turn out the highest class of machine work."

The full operation of the plant of the American Machine & Foundry Company requires a force of about 500 men. Although it has 100,000 ft. of floor space in its present plant, it has been so cramped for room that plans have been prepared for the erection of a steel concrete and glass factory, 70 x 700 ft., and four and five stories. Business conditions have caused a halt in the carrying out of the construction of the new plant, but work will be started next spring if circumstances warrant.

The company, whose machines have been exported to almost every part of the world, was established in 1900 with shops at Hanover, Pa., and removed to its present location, following a fire, in 1902. It was established originally by the American Tobacco Company for the development and manufacture of tobacco-working machinery, but became an independent company in 1912 when the tobacco company relinquished its stock ownership.

The H. M. Lane Company, Detroit, having completed the extensive sand tests it has been conducting for some months, has dismantled its experimental sand cleaning plant and foundry demonstrating plant and has moved its chemical and testing laboratory into another building. The engineering offices will hereafter be in the Trussed Concrete Building, Detroit, and the experimental laboratory at 208 Highland avenue, Highland Park, Mich. The company is now building a foundry for the Werner & Pfleiderer Company, Saginaw, Mich., and is rearranging and rebuilding the foundry of the National Transit Company, Oil City, Pa.

The final details of the dissolution of the Temple Iron Company were carried out at a recent meeting of its officers, when a resolution was adopted to decrease the capital stock from $2,500,000 to $250,000. It is probable that the Temple furnace, where this company had its inception, will be operated by the company as reorganized with the reduced capital stock.

NEW SOUTH WALES WORKS

American Practice and American Equipment for the Newcastle Steel Plant

The project of the Broken Hill Proprietary Company to establish a steel plant at Newcastle, New South Wales, was first publicly spoken of less than two years ago. In the past year construction work has been actively prosecuted. From a description of the present status of this company's works as given in the Australian Mining Standard, the following is taken:

The bulk of the machinery that has been installed is American and the plant is laid down according to the plans of the best American steel works, David Baker, formerly of Ladd & Baker, Philadelphia, being the engineer in charge. Six blast furnaces may eventually be built and of these one is under construction and four in all are laid out. The charging of the furnaces is to be accomplished by Baker-Newman rotary distributers. Special appliances have been put in for dealing with waste gas. As it comes from the top of the furnace it will be directed into a dry dust catcher and from there taken through a Steele and Ford washer which eliminates fully 95 per cent. of the total suspended matter. Thus washed the gas passes through large mains to the four large stoves of the improved Cowper type, built close to the water front on made ground. To secure a foundation piles had to be driven in over which a thick bed of concrete was laid. A portion of the gas will be taken to the 2500 h.p. Babcock & Wilcox boilers through an underground flue. These boilers will provide the power for the blast-furnace blowing engines of which there are at present three, two high pressure and one low. Each blast furnace will require 35,000 cu. ft. of air per minute.

STEEL WORKS AND ROLLING MILLS

Pig iron will be conveyed to the open-hearth steel department in 45-ton ladles. When the plant starts there will be three 65-ton fixed basic open-hearth furnaces in working order. Provision for the extension of this as of all other departments has been made and ultimately there will be 14 such furnaces. A two-strand pig-casting machine of the Heyl & Paterson type will take care of metal not used by the steel department. This cold pig iron will be handled by a 10-ton gantry crane with a 65-ft. span and 25-ft. cantilever extensions at either end. Magnets will load the pig iron and scrap into charging boxes, and these will be emptied into the furnaces by a low-type electric charging machine.

At the open-hearth furnaces the hot metal will be poured in by means of a 60-ton crane, and the steel when tapped will be lifted and poured into ingot molds by a 100-ton crane. An electric stripping machine of 150 tons capacity will remove the ingots, and a stiff-leg charging crane will place them in soaking pits, which are in a building adjoining the blooming and rolling mills. Two pits of four holes each, each hole having a capacity of six ingots, have been built. The 48 ingots represent two heats from the open-hearth furnaces.

The blooming mill and the engine for it were built by Mackintosh, Hemphill & Co., Pittsburgh. It is a 35-in. geared mill and is driven with a twin reversing engine having cylinders 42 x 66 in. The ingot will be reduced from 20 in. square to a bloom 8 in. square in 15 passes. The blooms will be run into the 28-in. rolling mill on electrically driven tables. The rail mill is of three-high type, built by the United Engineering & Foundry Company, Pittsburgh. Fed by two cranes, it is driven by a twin horizontal engine with 42 x 66 in. cylinders. This is of the reversible type with no flywheel. Having large expansion in view, the blooming and rail mills have been built to handle 2000 tons of steel rails per day.

ORE AND FUEL

The iron ore will come from the company's Iron Knob property in South Australia, the ships landing at a wharf 1200 ft. long immediately in front of the blast furnaces. Ore bridges are being erected which will lift the ore from the ship's hold either to the stock pile or directly into the receiving bins of the blast furnaces. The vessels will be reloaded with coal in the same way from a 5500-ton storage bin. Additional openings have lately been made in the ore deposits in South Australia, loading bins constructed and conveying belts provided so that a ship can be loaded with ore in a few hours. On arrival at the plant it will be unloaded in a couple of days, and the coal for the return trip taken on in one day.

Limestone may be drawn from the company's deposits on Wardang Island, South Australia. Other owned sources of supply are also available.

Coal will be brought to the plant from the Government coal mines at Tighe's Hill and discharged into a receiving hopper. By a traveling belt it will be distributed along the top of the bin. It will be delivered to the ships later by a belt conveyor, delivering 700 to 800 tons of coal per hr. The coal required for the first unit which is being constructed is estimated at 1200 tons per day. In addition the company will take large quantities of coal for its works at Port Pirie and Broken Hill so that the total amount passing over its lines, even in the first year, will be very large.

Coke for the blast furnaces is to be made in a battery of 66 Semet-Solvay recuperative by-product ovens now being erected near the blast furnaces. The gas will be used in the works or disposed of locally. This portion of the plant is not so far advanced due to delay in the delivery of material and appliances. The coke will be taken in steel cars to the coke bins at the rear of the furnaces and the coke, ore and limestone for each charge will be collected by an electrical traveling hopper and emptied into a skip-car at the foot of the furnace incline.

ELECTRIC PLANT

For lighting and operating, electricity will be largely used, but it is not the intention to attempt the manufacture of steel by electricity for the present. Electrically-driven centrifugal pumps will supply cooling water for the condensers and also the cooling water for the blast furnaces and coke ovens. In the electric power house will be three 500 kw. generators each driven by a combined vertical high-speed Belliss-Morcom engine.

The lighting plant will consist of a 250-kw. direct current generator driven by a Belliss-Morcom high-speed engine. Incandescent lamps are used. Five batteries of Babcock & Wilcox water-tube boilers of 1000 hp. each are being installed to supply steam for the power house and the rail mill. Provision has been made for enlargement. The boilers are equipped with induced draft fans and chain grate stokers. Steel hoppers will remove the ashes through a tunnel. An alternating current station is to be added when new mills are erected.

PRODUCT, RAILS AND STRUCTURAL SHAPES

Many miles of roadways have been laid out and there will be 20 miles of railroad. A fully equipped work shop is provided. The company owns about 264 acres of which about 50 will be required for the first unit. Some of the higher land will be used for the erection of houses for employees.

The principal output will be steel rails and the company will endeavor to secure the whole of the Australian trade in this line. At the same time the rolling mills will be able to turn out structural shapes of any size from 3 in. x 3 in. angles up to heavy 24 in. beams. The rolling of steel plates has not yet been provided for. Such a mill is however probable not long after the plant has been running.

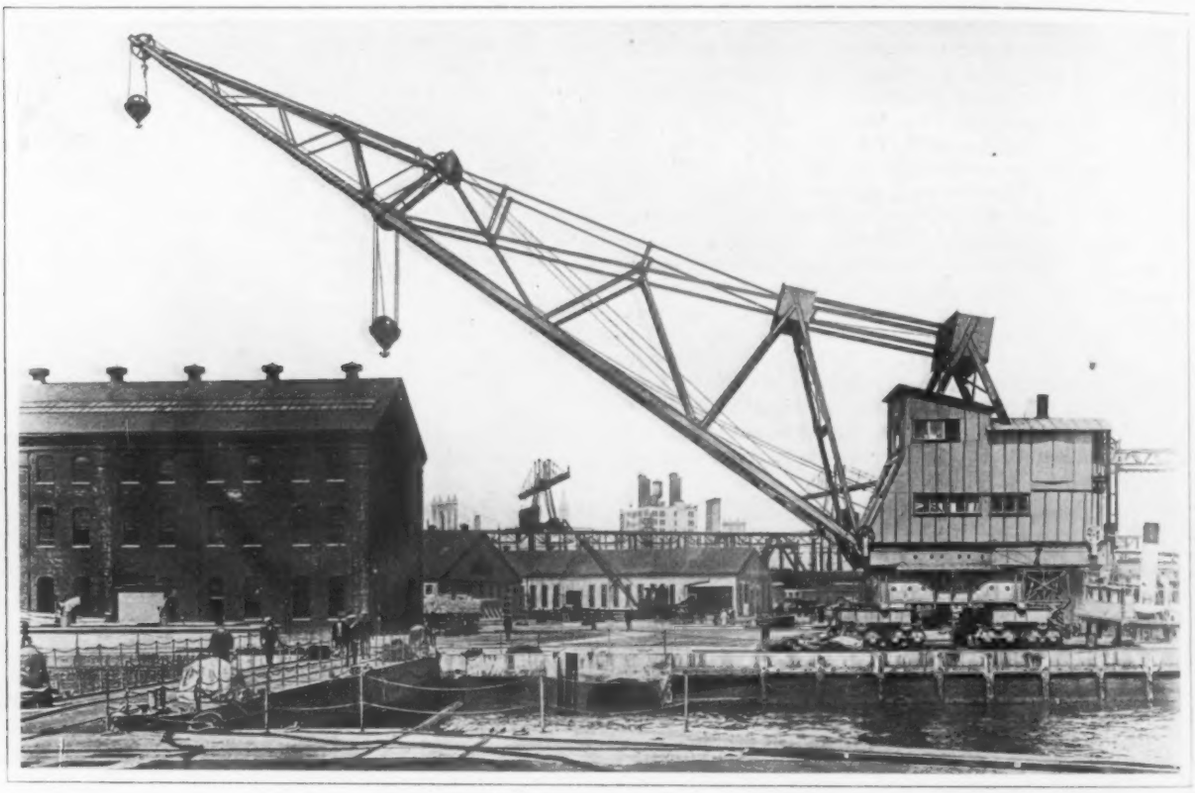
The first furnace to be started will have a capacity of 10,000 tons of pig iron per month. The steel department as at present constructed will be able to convert that amount into steel. Over 1000 men are now employed at the plant. The first blast furnace will be ready to start in October. It is expected that other sections of the plant will be sufficiently advanced to permit of the making of steel about the end of this year.

The Lake Superior Corporation reports its income for the year ended June 30, 1914 at $448,054, against $793,148 the previous year, and surplus, after interest and general expenses, $23,410, against $419,180.

Mammoth Locomotive Crane at New York Navy Yard

The latest mammoth locomotive crane installation at the New York navy yard is shown in the accompanying illustration. As far as the Browning Company, Cleveland, which built it, knows, it is the largest machine of its type built, building or contemplated. Since the war, by cutting off communication abroad, makes it impossible to corroborate this fully, it is suggested that it is, at least, the largest in the United States.

The main boom has a length of 85 ft. and a capacity of 50 tons at the full radius. It handles the big guns, armor plate, boilers and engines which are used in the largest warships. The extension boom, 38 ft. in length, is designed for the special purpose of handling the basket masts which are peculiar to the new dreadnoughts. Formerly it was necessary to cut these masts in half because there was no equipment of sufficient capacity to convey them as a unit. The new machine is designed for such work.



The Browning Locomotive Crane at the New York Navy Yard, Brooklyn

Method to Prevent the Stealing of Tools

Probably there is no one thing that causes more inconvenience and annoyance to machine shops and manufacturing plants in general than the theft of tools. Occasionally this may be done by employees, but usually by others who either want the tools for their own use or expect to sell them to persons not so careful in making inquiries as to how the tools came in the possession of the seller as they should. James H. Matthews & Co., Pittsburgh, manufacturers of steel lettering, dies and stamps, are making for a number of their customers steel stamps reading "Stolen from —— Company," to be used in marking tools or other supplies likely to be taken. Such a stamp on a tool would certainly prevent its being sold.

The Duquesne Motor Truck Company, Pittsburgh, has been incorporated in West Virginia with $25,000 capital stock by H. G. Putnam, J. H. Cronkright, Joseph Zamechnik, and others, of Pittsburgh.

Developments in the Safety Movement*

The small as well as the great accidents do not have the educational value that they should, and terrible repetitions assail us. The one-victim accident or the near-accident can and should be as instructive to us as the Iroquois fire or Empress of Ireland disaster. The desire for haste in the Titanic case was not greatly different from the dangerous risk that we take when we hop a street car, or the taxi's risk to please a passenger. Big accidents are not sporadic happenings under unusual circumstances, but come largely from racial habits of careless thought, and the man who causes a great catastrophe is anathematized for manifesting a racial characteristic.

PROMOTING THE BROTHERHOOD-OF-MAN IDEA

Safety work also is bringing great aid to the advance of the brotherhood-of-man idea. No other movement has served better to bring men together on a plane of mutual understanding, appreciation and co-operation than the safety movement. It has made workmen and management kin; has planted good-fellowship and a get-together spirit that means much and will mean more to the industries and to the country. In some respects these things make the safety movement one of the greatest movements of all time.

ACCIDENTS DECREASED IN NUMBER

The first six months in 1914 show a remarkable decrease of accidents in our plant as compared with the first six months when we commenced our work and with the first six months of 1913. In the first mentioned six months our compensation loss was $11,757.90; in the first six months of 1914 it was about $3,290.48, or a decrease of some 72 per cent. In the first six months of 1913 we had 499 lost time cases from accidents. In the first six months of

*From a paper by Arthur T. Morey, Commonwealth Steel Company, Granite City, Ill., presented to the American Foundrymen's Association.

1914 we had 246 lost time cases, a reduction of about 50 per cent. These reductions were in the face of an increase of some 20 per cent. in the number of men employed. Mechanical safeguarding will proceed to a practical efficiency, and the larger part, the education in habits of care, will complete the work, until we discover it entirely unnecessary to have these self-inflicted losses on the community.

DEVELOPING THE GOOD WILL

Having the men with us and having a good spirit in the organization are the great things. Without having the cordial co-operation of the men the best safety work cannot be done. That cordial co-operation can only be obtained by just and fair dealing in all other relations, and the earnest desire on the part of the management to treat the workmen as men and with every consideration, surrounding them with all proper and decent environments. We have a good lunch room for all the men, a good club house, a dining room for get-together luncheons of officials, night school, Fellowship Club, are establishing a refrigerated pure drinking water system throughout the plant, are shortly to provide locker, washing and shower bath accommodations for every man; we have some flowers and grass plots, and with it all we are avoiding all paternalism. We are simply trying to make ours a decent and attractive plant, and we feel that these better conditions are earned by the men and are not given to them, for they are part of the fruit of the men's toil. We are establishing an efficiency card record for all men who have been employed one year or longer, so their merit may be known and rewarded, and we are now having physical examinations made of all new men, from which will be developed many helps to the men.

Greater Output of Hoover Balls

The Hoover Steel Ball Company, Ann Arbor, Mich., has broken ground for two additional buildings. One will be 40 x 156 ft. and the other 40 x 200 ft. They will be devoted entirely to the manufacture of steel, brass and bronze balls, but will be utilized mostly for the manufacture of very high grade balls to take the place of the balls which were formerly imported from Germany and other foreign countries. There is an increasing demand for this grade of balls, and, as their production necessitates an entirely special process, it is the intention of the Hoover Company to meet these requirements in every respect. The company is therefore building its new ball machinery to be installed in these additions to its plant. The new equipment and new buildings will bring the daily output up to between 6,000,000 and 7,000,000 balls, making it one of the largest plants of its kind devoted entirely to the manufacture of balls, if not the largest. Ball-bearing manufacturers who have had their supply of balls cut off on account of the war will be pleased to learn of this new source of supply for their requirements. The Hoover Company, which has been importing all of its raw material, will continue to use imported material exclusively for its product, having a sufficient supply on hand to last for at least the next 18 months.

A new sheet-steel mill will be established in Mansfield, Ohio, by a company that will be formed to take over the plant of the old National Rolling Mill Company. The main building will be extended 240 ft. and three additional stands of rolls will be added. The new company will be capitalized at $300,000. It is stated that back of it are men who are well known in the sheet-steel industry, but whose names are not made public at present. Nobody associated with the old National Rolling Mill Company will be connected with the new company.

A SPECIAL SWAGING MACHINE

Design for Forming Thin Tubing by Using a Mandrel in Combination with Swaging Dies

The swaging machine shown in the illustrations is a special type built by the Langelier Mfg. Company, Providence, R. I. Its function is similar to

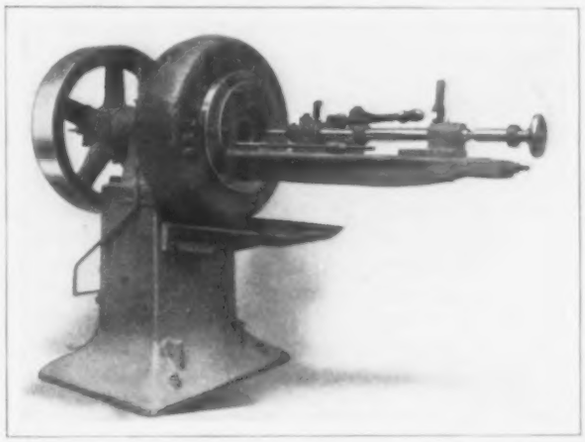


Fig. 1—Special Swaging Machine for Forming Thin Tubing

that of the machines used for tapering very small sizes of tubing of unusual thinness, but in this case the material is 0.807 in. in outside diameter, while the stock is 0.0393 in. thick. In procuring the taper the elongation is from a blank 5 11/16 in. long to 6.4171 in., and the material at the small end has been reduced to a thickness of 0.1377 in. With steel two operations are required, but with copper the task is accomplished in a single operation.

Because of the nature of the material a mandrel or arbor is employed, of the same form as that of the swaging dies. The work is slipped over the mandrel, which is shown in Fig. 1, and the mandrel is pushed forward into the dies by means of the handle at the rear. The space remaining between the mandrel and the dies represents the thickness

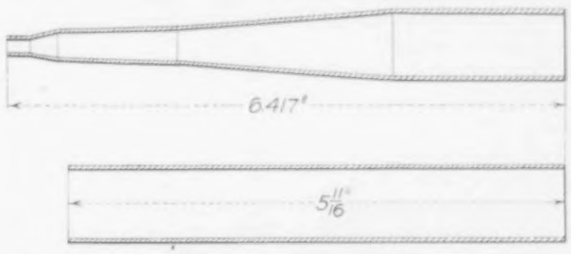


Fig. 2—The Blank Below and the Completed Product Above, Showing Elongation and Reduction in Thickness of Stock

and form of the completed work. The movement of the lever shown at the front of the machine brings the side head against the blank and forces it between the dies and mandrel. Production is rapid and accurate.

New Rolling Mill at Cuyahoga Falls

The Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, maker of round, hollow and solid staybolt iron and steel bars, will erect a rolling mill and muck mill. The plant will consist of one 18-in. muck mill, one 16-in. three-high Belgian train, one 12-in. three-high roughing and skelp mill and two 10-in. finishing mills. The buildings will be of steel construction and the plant will be modern throughout. The mills will be electrically driven. The plant will be located on a site between the tracks of the Baltimore & Ohio and Pennsylvania railroads.

Electrical Problems in the Steel Mill

What Was Brought Out at the Annual Meeting in Cleveland of the Association of Iron and Steel Electrical Engineers

An interesting programme of papers relating to the use of electricity and electrical equipment in steel plants was presented at the eighth annual meeting of the Association of Iron and Steel Electrical Engineers, held at the Hotel Statler, Cleveland, Ohio, September 14 to 19. The attendance was very satisfactory, there being 62 active and 84 associate members present. No one particular topic predominated at the meeting, but about an equal interest appeared to be taken in several subjects and lengthy discussions of these brought out much valuable information. The programme was a broad one, including various technical papers and in addition the discussion of other subjects, among them apprenticeship systems and organized safety in steel plants. The only general topic omitted that has been discussed at previous meetings was that of safety devices. That subject was left entirely for the Safety Congress of the National Council for Industrial Safety to be held in Chicago October 13, 14 and 15.

UNDERGROUND ELECTRIC LINES IN STEEL WORKS

Papers presented at the first professional session Monday afternoon were by F. D. Egan, Pittsburgh Crucible Steel Company, on "Underground Transmission in a Steel Plant"; by J. C. Bowman on "Underground Cables and Accessories," and by R. Tschentscher, Illinois Steel Company, on "Statistical Data of Electrical Application in the Iron and Steel Industry in the United States." Mr. Egan's paper was a description of the underground transmission system of the Pittsburgh Crucible Steel Company's plant at Midland, Pa. An investigation disclosed that the underground system could be installed at a lower cost than the overhead and that every factor leading to safety and continuity of operation was in favor of the underground system. No trouble has been experienced from the underground lines placed in operation about the first of the year, but in the past few months portions of the overhead direct-current lines have been blown down during storms and lightning has caused trouble.

ELECTRICITY IN STEEL MILLS

In collecting statistical data of electrical application in the iron and steel industry, Mr. Tschentscher received replies from 62 out of 85 companies representing approximately 175 out of 200 plants. Of the 62 companies reporting, 59 generate the electrical power required, the remaining 3 purchasing the power. He referred to the remarkable advancement in the use of electricity in steel plants in the last ten years and estimated that electrical application in the iron and steel industry requires 20 times the electrical energy that was necessary 10 years ago. He believed that no other single industry compared with the iron and steel industry in the rapidity of the advance of electrical application in this period and said that the indications are that the next 10 years will witness the elimination of practically all forms of drive other than electric. Electric power generation by means of gas engines and large turbines presents economies which have sounded the doom to local mill steam engine roll drives.

The session Tuesday morning was devoted to the subject of control apparatus for motors for iron and steel plants. Papers presented were "Application of Auxiliary Apparatus in Iron and Steel Mills," by Stewart C. Coey, Youngstown Sheet & Tube Company; "Magnetic Control Characteristics," by H. S. Stratton, Electric Controller & Mfg. Company, Cleveland, and "A. C. and D. C. Magnetic Control for Auxiliary Motors," by W. O. Lum, Westinghouse Electric & Mfg. Company. One of the principal points of discussion referred to efforts that are being made to design accelerating switches so that they will operate rapidly.

THE FREQUENCY FOR STEEL MILLS

At the Wednesday morning session a paper on "Some Electrical Problems Practically Considered," by B. G. Lamme, of the Westinghouse Electric & Mfg. Company, was read by Wilfred Sykes of that company and attracted considerable interest and was discussed at some length. This paper was a very exhaustive semi-technical discussion of many of the problems that confront the designing engineer in building apparatus for steel mill services and the steel mill engineer in applying it. The problems taken up referred to insulation, commutation, speed regulation of induction motors by primary and secondary circuit control and choice of frequency. He said that the present tendency of central station work and even power transmission is strongly toward 60 cycles. For motors, either synchronous or induction, 60 cycles present more advantages in general except for very low speeds and then with synchronous motors the choice is in doubt. In the case of induction motors there are fields where 25 cycles will show better results. This is in very low speed work. K. A. Pauly, of the General Electric Company, discussed the paper, particularly the part that referred to the speed control of induction motors by change in the secondary frequency. He said that he had made several comparisons between 60-cycle and 25-cycle installations to meet identical conditions. The results of these were: 60-cycle equipment can be built to meet rolling mill conditions and where 60-cycle power is available at low cost and where there can be no other points at issue, an equally reliable 60-cycle installation can be made at a lower first cost than one at 25 cycles, including its generating plant. If, however, other considerations, such as lack of dependence upon external sources of power, etc., are of sufficient importance to warrant a steel company in providing its own power, 25 cycle should usually be chosen as the operating frequency. A paper on "The Control of Induction Motors for Rolling Mill Drive," by Wilfred Sykes and G. E. Stoltz was also presented at this session.

ELECTRICAL APPRENTICESHIPS IN MILLS

A paper on the "Apprenticeship System as Applied to Steel Mills" was presented at the Wednesday afternoon session by B. W. Gilson of the Ohio works, Carnegie Steel Company, Youngstown, Ohio. Mr. Gilson declared that the future success of steel plants both as regards operation and production depends in a large measure on the character and

ability of men who are now being trained to fill responsible positions. He urged that a complete educational system in each plant could bring about wonderful results in increasing the efficiency of workmen and production. He said there are 200 corporations doing systematic educational work, but the steel mills are very low in the efficiency of their educational methods, and he urged also that a committee representing the association go into the matter thoroughly and recommend rules, requirements and specified courses which should be embodied in a universal system of apprentices, and that this system be started in all steel plants. After referring briefly to the educational work in the Ohio works, the writer outlined a universal system for apprentices in the mechanical and electrical departments of steel plants. A 3-year course was recommended with 6 hr. each week in class room instructions and a training shop for each department.

E. Friedlaender, Carnegie Steel Company, president of the association, said that it is up to the plant managers to allow the electrical engineers opportunity to educate the boys, but too much should not be asked of them at the present time in view of conditions. He did not think it practical to work out a universal system applicable to all plants, saying that a system that might prove successful in one plant might be a failure in another. However, he urged encouragement from plant managers in efforts to educate boys for their work, but not to make electrical engineers of them. He thought apprentice boys should be paid enough so that they would be self-supporting while learning.

Mr. Tschentscher heartily indorsed the apprenticeship system and outlined the system employed in the South works of the Illinois Steel Company. Where plants are located away from the large industrial centers, he said, the best plan would be to have class room work for the boys, but in large cities the boys could get similar instructions in night classes in public schools and other institutions. At the South works boys are taken as electrical apprentices at 18 years of age and great care is exercised in their selection. They are on probation 3 months and the course lasts 4 years. Boys that prove incompetent in that class of work are usually culled out within 2 years. A time bonus system is in effect so that boys may finish their apprenticeship in less than 4 years. He declared the system had worked out satisfactorily. Three-fourths of the repair shop force are either graduates or apprentices and some had been given good positions in other plants. In his opinion the human machine must be given more attention than it has in the past. Another speaker stated that good men were being secured from the colleges, but there were not enough of them and that it was up to the departments in steel plants to make their own men.

ORGANIZED SAFETY

At the Thursday morning session L. R. Palmer, Harrisburg, Pa., assistant commissioner of labor for Pennsylvania, presented a paper on "Organized Safety." He emphasized the value of team work and education in reducing accidents in industrial plants, saying that education is the biggest problem and the principal element in accident prevention. Safeguards alone, he declared, could reach but a scant 20 per cent. of the accidents. During the discussion that followed one of the speakers criticized the paper for not giving plant foremen and others credit for work that has already been accomplished in safety lines. Mr. Palmer replied that he thought he had given this credit by referring to the large reduction of accidents in many leading plants through safety work. He added, however, that plant managers should not pat themselves on the back too much until more accidents are prevented, stating in this connection that of 200,000 serious accidents in Pennsylvania plants in a year, over 100,000 could have been prevented. President Friedlaender said that he did not believe in safety signs. His idea would be to make all dangerous places safe and remove the signs. In the case of high tension wires he would put them high enough to be out of reach.

Other papers presented at this session were by W. O. Oschmann, Oliver Iron & Steel Company, on "A Synchronous Condenser Installation for Power Factor Correction and Voltage Regulation," and by R. C. Lanphier, Sangamo Electric Company, on "Watthour and Ampere-Hour Meters and Their Applications in Steel Mills." In the discussion of the latter paper, the opinion was expressed that economy in power consumption in steel plants could be effected by the use of meters.

CHAIN DRIVES IN STEEL PLANTS

A paper on "Silent Chain Power Transmission," presented Friday morning by F. L. Morse, of the Morse Chain Company, attracted much interest and brought out a number of questions, particularly regarding the use of chain drive in steel plants. The paper was for the most part a description of the mechanical construction of the Morse chain. He referred to an interesting installation of silent chains for driving the galvanizing pots of the American Sheet & Tin Plate Company, replacing worm gear and spur gear drives. In reply to questions he stated that chain can be used for a reversing drive but that it would not work quite as well in both directions as in one direction. Chain drives have been used several years for 4200 r.p.m. and chains have been run up to 6000 to 7000 ft. per min. It is not the number of feet per minute, but the number of revolutions per minute that bothers makers. Chain is used in many cases in a vertical drive, especially where the driven shaft is the lower one. Chain is being used for parallel drives for seven or more machines for driving nails in boxes, but he doubted if it would be satisfactory for roll tables. They have been run at a reduction of 10 to 1, but he regarded 6 to 1 reduction as the maximum in good practice. He estimated that 50,000 to 100,000 automobiles this year will be equipped with chains for time gears. He did not favor covering chains unless conditions were very bad, or running the chain in oil, admitting they would run better in oil, but the cost of installation would be increased. The looser the chain is run and made to work, the better. He estimated that there is 1,500,000 chain driven horse power in the United States. The maximum between centers for chain drive is 10 ft. He stated that a chain drive is now being installed to transmit 600 hp. for driving an 18-in. roughing mill in a steel plant.

THE FLAMING ARC FOR MILL LIGHTING

A paper on the "Flaming Arc Lamp in the Iron and Steel Industry," by Albert T. Baldwin, National Carbon Company, attracted much attention and discussion. Data secured from manufacturing plants in various lines showed that 6.9 per cent. have replaced their flaming arc lamps wholly or in part by tungstens and 93.1 per cent. have retained and increased their flame light equipment. The paper called attention to the new nitrogen gas filled tungsten lamp, which it was stated seemed to promise much for industrial lighting. Data were given

from tests made, which showed that the operation of the long burning flaming arc lamp was much cheaper than the gas filled lamp. Tests also showed that the life of the gas filled lamp is uncertain.

Other papers presented during the convention were: "Power Transformer Construction for Steel Mills," by G. A. Waters, Wagner Electric & Mfg. Company, and on "Switchboard and Switching for Steel Mills," by Saul Lavine, General Electric Company.

Considerable time was spent in the business session in discussions of a proposed co-operation between the American Institute of Electrical Engineers and the Association of Iron & Steel Electrical Engineers with a view of possible amalgamation. If such an amalgamation is effected the association would probably become a section of the institute and would hold separate meetings. While the sentiment seemed to be somewhat against any sort of amalgamation, at least at the present time, a motion was adopted recommending the appointment by the institute of a committee composed of men not members of the association to confer with a committee of the association regarding the merger of the two societies.

THE OFFICERS

Officers for the ensuing year were elected as follows:

President, O. R. Jones, Youngstown Sheet & Tube Company.

First Vice-president, F. H. Kittredge, Illinois Steel Company.

Second Vice-president, F. D. Egan, Pittsburgh Crucible Steel Company.

Treasurer, James Farrington, La Belle Iron Works, re-elected.

Secretary, W. T. Snyder, National Tube Company, re-elected.

A number of entertainment features were provided for the members and their wives. These included the annual banquet held Wednesday evening. A. C. Dinkey, president of the Carnegie Steel Company, acted as toast master. Speeches were made by Charles F. Brush of Cleveland, Farley Osgood, general manager of the Public Service Corporation of New Jersey, and others.

On Tuesday afternoon the engineers took a trip to the ore dock of the Pennsylvania Railroad Company, the Lakeside power house of the Cleveland Electric Illuminating Company and the Nela Park Laboratory of the National Electric Lamp Association. The entire day Saturday was left open for excursions and trips to plants. The convention exhibit included products of a number of manufacturers and photographs of safety devices in connection with electrical equipment used in the plants of subsidiary companies of the United States Steel Corporation, Republic Iron & Steel Company and in the mines of Pickands, Mather & Co.

The Gun-crete Company, Chicago, has purchased the rights, titles, contracts and interests of the Cement-Gun Construction Company and also taken over the construction department of the General Cement-Gun Company. The consolidated companies are to be known as the Cement-Gun Construction Company and the business will be conducted from offices at 914 South Michigan avenue, Chicago. In addition to doing all forms of cement-gun construction work, the company will sell and lease complete cement-gun outfits. It has just closed a contract with the Odanah Iron Company, Hurley, Wis., for lining a mine shaft with Gunite, thus protecting the steel sets against corrosion, and protecting the wood lagging against decay and fire, making the shaft fire and water proof, the work to begin immediately.

Storing Surplus Cotton in Texas

AUSTIN, TEXAS, September 19, 1914.—It is estimated that it will cost between $4,000,000 and $5,000,000 for the erection of warehouses in which to store the cotton crop of Texas. That no difficulty may be experienced in obtaining insurance on the contents, it is proposed that the maximum capacity of the warehouse shall be 2500 bales. Most of them, however, will be much smaller than this. The average capacity will be perhaps 500 to 800 bales. To make them as nearly fire-proof as possible, they will be largely of iron and concrete construction. All told, there will be about 5000 of these warehouses needed to provide storage for the present cotton crop. The type that is most favored is an open shed, erected on an 8-in. concrete foundation about 8 in. above the level of the ground. Extending outward from this foundation is a shallow concrete gutter adequate for drainage. The shed is covered with corrugated iron on a 7-ft. studding. In the dirt floor are concrete rests 4 in. wide, 6 in. high and 2 ft. apart, on which the cotton can be stored on end. The shed should have 8-ft. main aisles and 6-ft. gangways, with an open space or gangway 6 to 8 ft. wide all round the storage on the outer edge so that the cotton will be set back far enough to be protected from beating rains.

Such a structure commands the lowest rate of insurance, and can be operated with the least amount of labor, and when attended by a trustworthy watchman could not possibly be destroyed by fire. In case a bale is discovered on fire it can be rolled out easily. Cotton thus stored on end is easily handled, and a shed in this manner of storage will hold two-thirds as much as if the cotton were laid flat in tiers. The greatest number of bales under one shed at which the minimum rate of insurance may be obtained is 2500, and would require, under this plan of storage, a building 148 ft. square, and 1000 bales would require 94 ft. square, allowing in each case one-fourth the entire space for aisles and gangways.

World's Drilling Record Claimed

The Detroit Twist Drill Company, Detroit, Mich., claims the world's drilling record as the result of a test at the recent Foundry & Machine Exhibit in Chicago.

On Friday afternoon, September 11, the last day of the convention of the American Foundrymen's Association, a Detroit 1½-in. high speed drill was tested in a 35 to 40 point carbon steel block 4¼ in. thick, the Colburn drill press of the Colburn Machine Tool Company, Franklin, Pa., being used for the purpose. The speed was set at 343 r.p.m. The first hole was drilled at 0.019 feed, the second at 0.032 feed, the third at 0.043 feed and the fourth at 0.061 feed. In the last hole the drill stopped the drill press. The drill was resharpened and started cold at 343 r.p.m. and 0.061 feed, 134.6 ft. per min. and drilled 3¼ in. deep in the fifth hole and again the drill press was stalled. The 25 hp. motor was unable to drive the press, and in the midst of a maze of smoke, due to the burning of the belt, the drill was again removed and found in excellent condition. This was a very superior record to that of the only other 1½-in. high speed drill tested in this high carbon steel at the convention. The Detroit drill drilled more holes and more inches. It was a regular stock drill and the only drill of that size the company had at the exhibition.

Deposits of high grade iron ore have been discovered recently on the Copper River in the New Hazelton district, south of Prince Rupert, British Columbia, according to Consul General R. E. Mansfield, of Vancouver, Canada, in Daily Consular and Trade Reports. It is reported that 10,000,000 tons has been already blocked out on the surface, shafts showing it to be at least 45 ft. deep. The claims are controlled by the Northern Pacific Mines Company, of Prince Rupert, which is associated with the Macfarland syndicate of Seattle, Wash. Original plans called for a blast furnace near Vancouver, but the discovery of the new deposits may result in placing it near the mines.

EFFICIENCY SOCIETY MEETS

Topics Discussed Last Week at Lake Placid, N. Y.—Future of Society

What looks like a new lease on life was taken last week by the Efficiency Society. Officially it held a fall meeting at the Lake Placid Club in the Adirondacks, but practically 5 per cent. of its numerical strength did the meeting and while it listened to papers and addresses of a high order and from authors of authority, it considered seriously to what degree the organization was living up to its purposes and what should be the programme of its future activity. As one session followed another, the meeting extending over four days beginning September 17, the inspiration of the occasion grew and it was the general concensus of opinion that the gathering had been unquestionably profitable to the participants. Meanwhile the feeling developed that the society was not organized wholly as a medium for establishing forums, however important these are. Instead a desire to formulate very definite objects was shown with the result that after protracted discussion it was resolved that by the time of the annual meeting, about three months hence, work along different lines than those followed in the past would be taken up. For example, it was pointed out that the society needs to establish standards of practice, such as a uniform method of making financial reports, and that in addition to receiving and discussing papers, as in the past, committees would have to be appointed to prepare such standards and it was also suggested that round table conferences be held for the informal discussion of problems not always well disposed of in the more formal or scheduled sessions.

It was brought out that the society has no less than 850 members who have paid this year's dues and that some 350 others are carried on the rolls as also actively interested. A brief statement of the financial condition was also reassuring. The relatively small attendance was attributed to the time of the year, the general adverse conditions of business and the relative inaccessibility of the place of meeting without due knowledge of the delightful and favorable situation otherwise. The success of the meeting is due largely to a group of the membership who had been planning for months and whose devotion spells a belief in the need of an organization to treat of problems common to diversified industries and professions and through their solution to promote efficiency. Among these are numbered W. Herman Greul, Otis Elevator Company, New York; F. Hawley, Arthur G. Maury, M. M. Ferguson, Hayden, Stone & Co., New York, and Wait S. Goodwin, New York.

The sessions were planned to cover different subjects, such as general organization and management, production efficiency, distribution efficiency and office efficiency. The papers in general were highly informing and some of them will be printed in these columns as space allows. The papers under the first division were as follows: "The Legal Structure of a Modern Corporation," by Judge Alfred P. W. Seaman; "The Budget Plan as Applied to Commercial Enterprises," by F. R. Hazard, president Solvay Process Company, Syracuse, N. Y., and "One Man versus Group Control," by C. U. Carpenter, president Fireproof Furniture Construction Company, Miamisburg, Ohio.

The papers on production efficiency included "Scheduling, Routing and Dispatching Work Through a Factory," by Geo. DeA. Babcock, production manager, H. H. Franklin Mfg. Company, Syracuse, N. Y.; "Production and Fatigue," by Frank B. Gilbreth, Providence, R. I., and "The Proper Relation of the Cost Department to the Factory Organization," by Clinton H. Scovell, Clinton H. Scovell & Co., Boston, Mass.

The papers on distribution efficiency included "How Sales Can Be Increased by Study of Fundamental Business Conditions," by Roger Babson, president Babson's Statistical Organization, Wellesley Hills, Mass., and "Developing Salesmen Through Cooperation with the Advertising and Credit Departments," by Jas. W. Fisk, salesmanship division, Dry Goods Economist Training School, New York City.

The papers on office efficiency included "Planning and Equipping an Office," by W. J. Coward, comptroller and assistant treasurer, Manning, Maxwell & Moore, New York City, and "Getting the Office Work Done," by Harold Dudley Greeley, J. Lee Nicholson & Co., New York City.

Among papers given at other sessions may be mentioned one by W. N. Dickinson, General Elevator Company, New York City, on "Cooperation Among Competitors." Addresses were made also by Dr. Melvil Dewey, president of the Lake Placid Club and host to the visiting members of the society, by Roger Babson, on what efficiency teaches will be the result of the European war, by Charles W. Tomlinson, general Eastern Agent, Baltimore & Ohio railroad, New York City, and others.

Manganese Ore and Ferromanganese

Letters received in Philadelphia indicate some of the difficulties which have been encountered in the effort to ship manganese ore from Bombay, India, where ocean freight has advanced from 17s. 10½d. to 24s. and 25s. since the war broke out. One vessel which was chartered at the lower rate broke the charter to take a cargo of sugar instead of ore. Another vessel was then chartered at 24s., but this was requisitioned by the British Government. A third boat was then engaged at 25s. The taking of steamers by the Government has made shipments particularly difficult from India. As regards Caucasus ore the letters point out that shipments from Poti are practically barred, because the Russian Government has commandeered most of the wagons used in transporting the ore to seaboard, while a further hindrance is grave doubt as to the possibility of passage through the Dardenelles. At the outbreak of the war it is said that there was but 10,000 tons of ore actually in the ports of Poti and Batum, on the Black Sea.

A London authority on manganese ore states in the letters referred to that the Caucasus production has been at the rate of 1,000,000 tons per year. In view of the shortage in the supply of ore which is indicated, this writer believes that a corresponding scarcity of ferromanganese may yet prevail. The freer deliveries of the latter which have been made to America in the past few weeks are ascribed to the release of accumulated stock in England. Two boats which brought about 11,000 tons of manganese ore are now at dock in Philadelphia and two more boats on the way will shortly make the total supply here about 20,000 tons, or enough to make over 8000 tons of ferromanganese.

The American Manganese Mfg. Company, Philadelphia, will begin the manufacture of 30 to 40 per cent. ferromanganese at its Dunbar, Pa., furnaces September 28. It has on hand 200 cars of Cuyuna manganiferous ore and another steamer is now loading at Duluth.

The Globe Iron Company, Jackson, Ohio, has built an additional hot-blast stove, making a total of five that it now has in operation. It has also finished enlarging its pig-iron bed. The improvements now completed make its blast furnace one of the most modernly equipped in southern Ohio.

Modern Practice in Die-Casting*

The Widening Field of the Process, the Alloys Used and the Limitations of the Product Toward Replacing Sand Casting

BY CHARLES PACK†

Die-castings may be defined as finished castings, the metal having been poured and allowed to solidify in permanent metallic molds. This definition would include a number of casting processes, the products of which are not commercially recognized as die-castings, such as the casting of cheap lead figures, lead battery plates, dental appliances, etc. Here the molten metal is poured from an iron ladle into a permanent metallic mold filling the mold by its own gravity and using no external pressure. To exclude these processes, die-castings must be defined as "finished castings made by pouring molten metal under pressure into a metallic mold."

The process of die-casting consists essentially in melting the die-casting alloy in a suitable container and forcing it, under pressure, into a metallic mold or die, producing smooth finished castings requiring little or no machining and being ready for buffing or plating without any grinding or cutting down. The process is best adapted to small intricate parts where accuracy and uniformity are essential. The process is limited to a group of alloys having a tensile strength not exceeding 20,000 lb. per sq. in., which limits the application of this process to machine parts not subject to severe strain or shock. It is, however, possible by a careful study of the service conditions to redesign castings, either by the addition of ribs, webs, fillets, etc., or by the insertion of steel or bronze inserts to so strengthen die-cast parts that they may successfully displace the stronger alloys of copper and iron.

Although the principles of die-casting have been known and practiced for many years, the advent of successful die-casting as an individual industry dates back to a period of no more than 15 years. By careful study and experiment it has become possible to enlarge the area of its application and at the present time the manufacture of die-castings forms an important branch of the non-ferrous metal industry.

Die-castings are now used extensively for both useful and ornamental purposes. They constitute the vital parts of various types of automatic vending machines, photographing machines, typewriters, cash registers, magnetos, motor starting devices, time controlling devices, counting machines, water circulating and force feed pumps, player pianos, roller and ball bearings, connecting rod and crank shaft bearings for internal combustion motors, gas meters, electrical measuring devices, mechanical and electrical horns, phonographs, and for many other purposes too numerous to mention here.

DIE-CASTING PROCESSES

The processes in use for the manufacture of die-castings may be divided into two groups, viz.: Air machines and plunger machines. In the former type of casting machine, the metal is melted in a suitable iron pot fitted with air-tight cover. The air valve is opened to admit air, which forces metal upward into the die. Although there are a number of air machines where metal is poured downward with gravity, the greater number called to the attention of the writer force the metal upward and against gravity.

The plunger type of casting machines, although open to a number of objections, have proved more successful in practice and are used to a much larger extent than the air machines. The writer will confine himself to the machine and process patented by H. H. Doehler in 1907. This process, which is undoubtedly the best of either type, is now being successfully used in all parts of the United States, as well as in Canada, Great Britain, Germany, Austria and Hungary.

CONSTRUCTION OF DIES

Dies are constructed from model or blueprint furnished. The design and construction of the dies constitutes one of the most vital factors in the successful operation of the process. The designer of the die must find the proper location for the gate, which is a very important factor, far more so than in foundry practice. A machine part often pronounced a casting impossibility may be made a possibility by the ingenuity of the die designer.

A better understanding of the importance of the die construction may be gained by a consideration of the die cost. Dies for simple parts may cost from $25 to $100; for more intricate parts from $100 to $500, and for very complicated parts die cost may run as high as $1000. Although the latter figure seems high, die-castings made from such die still show big savings, since otherwise there would be no demand for such dies.

The predominating features of die-castings are their high degree of accuracy and uniformity. Die-castings can be made to specifications of plus or minus 0.005 in. and when necessary, if conditions permit, to specifications of plus or minus 0.0005 in. These conditions depend upon the alloy to be used and construction of die. Generally, specifications of plus or minus 0.0005 in. can only be had on castings whose dimensions do not exceed 1 in. either way. It must, however, be understood that closer specifications require more careful die work and consequently higher die cost. Limitations should therefore be made as liberally as requirements will permit. From the foregoing it will readily be seen that in the construction of dies only high skilled mechanics can be employed. The employment of inferior labor in this department would be a false economy, since a single misstep may ruin weeks of good work.

DIE-CASTING ALLOYS

The alloys used for die-castings may be divided into three groups, viz.: A, zinc alloys; B, tin alloys; C, lead alloys.

Alloys of Group A

The writer in his experience has found the constituents of these alloys to vary as follows:

Zinc	70 to 90 per cent.
Tin	0 to 20 per cent.
Aluminum	0 to 5 per cent.
Copper	2 to 5 per cent.
Antimony	0 to 2 per cent.
Lead	0 to 2 per cent.

*From a paper presented at the annual meeting of the American Institute of Metals, Chicago, September 8.

†Doehler Die-Casting Company, Brooklyn, N. Y.

A typical example of this group of alloys is the following: Zinc, 84.5 per cent.; tin, 9.0 per cent.; copper, 4.5 per cent.; aluminum, 2.0 per cent.

Zinc alloys of the type given have a tensile strength not exceeding 18,000 lb. per sq. in., and an exceedingly low elongation and reduction of area. The strength of these alloys compares favorably with cast iron. Zinc alloys are corroded by aqueous solutions of any kind and should not be used for food containers or conveyors. Gasoline, which theoretically should be inert toward metals, has been found to corrode zinc alloys, when in direct and constant contact, due to impurities in the commercial gasoline sold to motorists. A good copper-plating, however, will aid a zinc alloy to resist the action of gasoline.

Zinc alloy die-castings may also be plated with nickel, silver, brass, etc., and such coatings protect the castings from corrosion. Zinc alloy die-castings may be buffed to a beautiful white polish, which, unfortunately, becomes dull upon exposure to atmospheric conditions for a few days. A permanent white polished surface may be imparted to zinc die-castings by electro-plating with nickel and buffing.

Of all die-castings produced in this continent and in Europe, approximately 85 per cent. are made from zinc alloys, 10 per cent. are made from tin alloys of group B, and 5 per cent. from lead alloys of group C.

An understanding of the extensive application of zinc die-castings may be gained by a partial enumeration of the parts for use in the motor vehicle industry: Magnetos, self-starting devices, water-circulating pump bodies, force-feed oil pumps, ball-bearing cages, speedometers and wing nuts for windshields. Many of the inventions patented annually would not be commercial possibilities if the present-day zinc alloy die-castings were not available. The numerous automatic vending machines on the market today illustrate this fact.

Alloys of Group B

This group, containing 60 per cent. and upward of tin, may be said to consist entirely of babbitt metals. The original tin, antimony, copper alloy patented by Isaac Babbitt has undergone numerous changes. Constituents have been varied, lead and zinc have displaced the higher priced tin in many cases, and at the present time any white metal alloy used for bearings is usually styled babbitt metal. Die-castings of this group are mostly used for motor bearings, although they are also used for machine parts where resistance to corrosion is of major importance and where high tensile strength is not required.

In the die-casting process the metal is poured under pressure into a water-cooled metallic mold. The rapid chilling produces a close-grained babbitt bearing, free from blows and dross spots, so often encountered in the place-poured bearing. An automobile concern producing 50,000 cars per year has used successfully die-cast bearings for eight years without a single complaint and many die-cast bearings on that particular make of car have traveled 50,000 miles and more only requiring slight adjustment occasionally. The alloy used by this company is of the genuine babbitt type, i. e., containing only tin, copper and antimony in proportions varying only slightly from the original Babbitt formula. The die-casting company producing these bearings uses only primary Straits tin, Cookson's antimony and the finest drawn or rolled Lake copper. This alloy is mixed by a process in which no constituent is heated above 750 deg. F., and after mixing it is kept below this temperature until cast. Die-cast bearings made in this manner are far superior to those cast in place around the shaft and also more economical.

Under this group of alloys mention must also be made of Parson's white brass, an alloy of tin, zinc and copper. This alloy cannot be cast in the plunger type of machine (due to freezing of plunger), and only with difficulty in the air machine. The alloy, although partially molten at 400 deg. F., is not thoroughly fused and entirely liquid until a temperature of 1000 deg. F. is reached, at which temperature the alloy drosses excessively, segregates easily and is in general a poor die-casting alloy. There has been, however, a demand for die-castings of the tin-zinc-copper type and this has caused the placing on the market of a bearing metal known as Comet white bronze, an alloy consisting essentially of tin, zinc and copper, in such proportions and treated in such manner as to overcome the objections to which Parson's white brass is open, although retaining its good bearing qualities.

Alloys of Group C

These alloys, containing 60 per cent. and upward of lead, are so well known as to require no further discussion here beyond saying that the die-casting process is not limited to any particular composition and is applicable to all alloys of this type.

BRASS DIE-CASTINGS

Following are a number of reasons why brass die-castings cannot be produced commercially: The writer has seen produced brass die-castings of small machine parts, but due to advances that have been made in modern foundry and machine shop practice, these castings could be made cheaper when sand cast.

Modern automatic molding machines, automatic screw machines, etc., make it possible to produce small brass castings accurately machined at a comparatively low figure. In order to compete, brass die-castings must be made rapidly, must be accurate to within at least plus or minus 0.002 in., and must have smooth finished surface. The expansion and contraction of the metallic molds used make accuracy impossible.

Although it is possible to make brass die-castings by forcing molten brass into a metallic mold, it will be found that after 500 or 1000 castings have been made the mold will crack or warp, necessitating the construction of a new die, which is usually very expensive.

ALUMINUM DIE-CASTINGS

The die-casting of aluminum alloys shows more promise of becoming a permanent industry. Some very complicated aluminum die-castings are being produced. The writer is not at liberty to discuss either the process or alloy used, since patents are pending for both.

The Hamilton Mfg. Company, wood and metal type cabinets and furniture, Two Rivers, Wis., distributed approximately $17,000 among its employees as of July 30, 1914, under a profit-sharing or premium wage system placed in effect July 1, 1913. Each employee who had been in the company's service for not less than seven months on July 1, 1914, received a premium of 7 per cent. on all wages earned during that period. The individual amounts ranged up to $65. The company has decided to continue the arrangement for another year.

ESTABLISHED 1855

THE IRON AGE

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The Railroad Crisis

The granting by the Interstate Commerce Commission of a hearing on the new case of the Eastern railroads was the only defensible outcome of the petition filed last week. The decision of July 29 making some advances to some lines chiefly gave a stone in place of bread, by telling the petitioners how to get along without increasing freight rates. There has been no chance to appraise the effects of the faintly favorable parts of that finding, the war having caused for the time every other fact and influence to dwindle to insignificance. But as the blight of the war has spread over industry, the condition of the railroads has more and more assumed the proportions of a common peril.

President Wilson was quick to grasp the seriousness of the situation when the railroad presidents came to him with their case. It was not only the general breaking down of credit due to the war, which was urged upon him, and the rise of interest rates beyond the net return upon railroad property, but the endangering of the investments of several millions of individuals and, through the holding of life insurance and trust companies, important interests of other millions. The railroads had lost in revenues by the war, and they faced a further serious shrinkage in their securities from the avalanche of European holdings of these stocks certain to come down upon the New York market whenever the Stock Exchange should open. Admitting the extraordinary emergency, the President urged that "we must all stand as one to see justice done and all fair assistance rendered and rendered ungrudgingly." He apparently went as far as he could with propriety, in saying that "undoubtedly men both in and out of official position will appreciate what is involved and lend their aid heartily wherever it is possible for them to lend it."

The Interstate Commerce Commission said, on July 29, in refusing the full 5 per cent. increase asked, that the fears the railroads had of great difficulties in renewing short-time notes and other obligations, due to declining net revenues, had not been borne out, and that with "growing ease in the money markets" the troubles met in the financing of 1913 were disappearing. The steady decline in values of railroad stocks for months before the July decision by no means bears out this view. Many railroads will plainly be unable to retain their capital without the aid of advanced rates. And now there is no escape from the judgment of the railroad presidents that "competition for capital will be keener and interest rates higher for some years to come than in any corresponding period within living memory."

While business has taken hope at the announcement of a rehearing, the hope is tempered by the knowledge that there will be no early relief. The commission fixed October 19 for the beginning of the hearing and explained that this delay was to give shippers an equal opportunity with the railroads to be heard if they so desire. This is called "the usual notice assigned in cases of great importance." Why the "usual notice" in an emergency such as the business of the country has never faced and probably never will face again? Congress took much less than 30 days to pass a measure overturning the practice of years in the matter of American registry for vessels, because it was believed only revolutionary action would meet the situation. Much less than 30 days will be required to pass a war tax measure providing $105,000,000 of additional revenue the Government must have.

The dire straits of the railroads, due to the war, are increasingly a peril to the steel industry, for railroad buying which had shown some signs of improvement in the first half of the year has now practically ceased. There is thus added to the menace to railroad credit a menace to the transportation service itself. The apparent concern of the commission lest shippers may not have time enough to prepare their case is entirely misplaced. It is the war crisis alone that makes this rehearing possible, and it is the war crisis, also, that is leaving thousands of shippers with less and less to ship.

The present is a time for extraordinary measures of ever the country has known one. Yet here is a commission which offers the "usual" procedure in a matter where only prompt relief can be called relief. One more war measure seems called for—a measure dealing with the Interstate Commerce Commission in its present capacity as an inefficient government instrument and an obstructor of the country's business.

Sanity on South American Trade

The South American trade movement is developing a good deal of zeal that is not according to knowledge. The situation is eminently one that will be best treated by making haste slowly. In the belief that some thousands of beleaguered buyers to the south of us are just now waiting to be relieved of orders, some manufacturers are hurrying salesmen to the scene. There will not

only be disappointment at the results in some of these cases, but harm will be done to the chances of success from the properly directed effort of others.

Highly commendable is the promptness with which the business men of the country have sprung into the midst of the South American problem. In some ways the situation has taken on the aspects of a warm political campaign. The flood of talk let loose is one of them. There is evidence of a great and impatient desire to get something done—to make up in the intensity of the immediate movement for a good deal of lost time and opportunity. Some of our statesmen at Washington have burst into an enthusiasm over business promotion that they have not been suspected of having. In the Senate, for example, a resolution was passed calling on the Secretary of Commerce for a detailed estimate of the expense of sending "at least six" Government vessels to South America bearing samples of the products of this country, also delegations from trade organizations and presumably—though not specified—a full complement of brass bands. Secretary Redfield in his reply, which is marked by both patience and respect, has well summarized the things that need most and first to be done in dealing with the present crisis—for it is a crisis—in South America's business and finance. He makes it plain that the Senate's trade excursion and relief expedition proposal does not meet the needs of the case. In brief the treatment he prescribes is indicated in these sentences:

> Financial and trade conditions in Latin-American countries are such at this moment that any development of our commerce must proceed under the most carefully laid plans if actual disaster is not to result. The crisis in Europe has affected those countries very disastrously and only those who are prepared to take certain risks or to make actual investment of capital in Latin-America can hope for early material advantage from the present situation. . . . For the moment it seems that the policy called for is that of service to South America by helping her regain her credit rather than to expect her under existing conditions to make large purchases.

The Department of Agriculture has done a practical thing in finding out that a market can be made here for 10 per cent. more Chilean nitrates than this country has taken heretofore. In other directions good work is being done in finding ways of increasing our barter with South America, for now more than ever if business is to be done it must be on the basis of paying for product with product.

In finance, while steps are being taken for the establishment of banks in South America, what is of greatest present moment is to finance in this country particular projects for which European financial arrangements were swept aside by the war. Chile, for example, has detailed plans which were prepared in the United States for $3,000,000 railroad shops, the steel and equipment for which will come to this country if bonds can be sold here.

All the agitation and study of South American problems now going on are well. It must result in time in a very important increase in our trade. But quick action, inspired only by the idea of realizing at once upon the situation created by the war, will do harm rather than good.

British Foreign Trade in August

Unfortunately the detailed statistics of the foreign trade of the United States are published so tardily that it will be two or three weeks before figures are available showing our iron and steel imports and exports in August. The British Board of Trade is very prompt with its statistics, and the figures of British iron and steel imports and exports in August are already available on this side.

It must be remembered, of course, that the entire month of August was not in all respects a war month, so that there were some movements in the early days of the month that did not continue, and figures for August as a whole are not representative of conditions prevailing say in the second half of the month. On the other hand, some movements are in progress this month that did not occur in August. It is well to recall, before considering the British figures for August, the dates fixing the outbreak of the war. On Monday, July 27, the Paris, Vienna and Brussels bourses were closed. On Friday, July 31, Germany declared a state of war, or martial law, and the principal stock exchanges of the United States did not open. Late on Tuesday, August 4, England declared war, and there is no doubt that for several days there had been fighting and violation of territory at numerous points on the continent. There was time in August, therefore, for a very limited amount of commerce to be conducted before the full throttling occurred.

Comparing the British trade movement in August with that of July, there was a decrease in iron and steel imports of 148,368 tons, or 70 per cent., while exports decreased 173,696 tons, or 55 per cent. British iron-ore imports, not included in iron and steel, decreased 170,407 tons, or 30 per cent. Naturally the decreases in imports were not uniformly distributed. Imports of blooms, billets and sheet bars from Germany decreased 38,234 tons, or 81 per cent., and the much smaller imports from Belgium decreased an equal percentage.

There was no uniformity in the decrease in iron and steel exports. The decreases were greatest in pig iron, ferromanganese, tin plates and galvanized sheets, and least in wrought-iron bars, steel bars, hoops, and wrought and cast pipe and fittings. Plates actually showed a slight increase. Where countries of destination are indicated, the decreases are seen to be greatest to the continent and least to the far removed markets, but in several important instances the decreases were greater to France than to Germany.

The decreases in British iron and steel exports in August are not, of course, an indication of the decreased buying power of continental or neutral markets, for the tying up of vessel movement was doubtless the larger influence. The September figures will furnish a much better measure of the ability of neutral markets to take goods, for this month the movement of British vessels is much less restricted. While the British iron trade is making every effort to conduct an export business, and in particular to capture the customers of Germany

and even of Belgium and France, it is hardly likely that in the near future the total volume will reach the level of just before the war.

Heavy Decline in Our Foreign Trade

While the fact has been known that our foreign trade has been seriously interfered with by the European war, the extent to which this trade has fallen off has been purely conjectural. It is now definitely shown by the publication of the August import and export statistics by the Bureau of Statistics at Washington. The report states that our total exports of merchandise in August amounted to only $110,337,545, against $154,138,947 in July and $187,909,202 in August last year. The drop as compared with one year ago was therefore $77,571,475. No single month since July, 1909, has shown so small a total of merchandise exports for the country. Imports also fell off considerably, but not so much as exports. The August imports totaled $129,399,496, against $159,677,291 in July, and $137,651,553 in August last year. The imports were the smallest in any month since September, 1911.

The excess of the value of imports over exports in August was $19,061,951, against an excess of exports in August last year of $50,257,467. This shows a change in the balance of trade of almost $70,000,000.

Cotton exports in August declined $15,213,452 as compared with the corresponding month last year; mineral oils, $4,553,587; meat and dairy products, $3,362,388. Breadstuffs alone made a favorable showing against August, 1913, with a gain of $852,527. It appears, therefore, that had it not been for the large volume of wheat shipped to the countries at war in the last half of August, the trade balance would have been still further against us. While our exports from this time are likely to increase, with the better movement of transatlantic shipping and the persistent European demand for our products, imports are bound to decrease because merchandise cannot be forwarded from continental Europe in the same volume as in the early part of August.

Cambria Steel Company Will Move Sales Offices to Philadelphia

The general sales offices of the Cambria Steel Company, now located at Johnstown, Pa., are to be moved within a few weeks to Philadelphia. W. H. Donner, president of the company, recently changed his residence to a suburb of Philadelphia, and J. L. Replogle, vice-president and general manager of sales, now located at Johnstown, will remove to Philadelphia about October 1, shortly after which the entire sales office will also be established there. The executive offices of the Cambria Steel Company are in Philadelphia, and it is desirable to have the executive and sales offices together for convenience as well as economy. It is expected that not later than November 1 the entire sales offices will be located on the seventeenth floor of the Morris Building in that city. It is also the intention of the company to establish sales offices in the near future in Rio Janeiro, Brazil; Mexico City, Mexico; Buenos Aires, Argentina, and London, England. The company proposes to seek foreign trade vigorously, and in this the location of the sales offices in Philadelphia will be advantageous.

CORRESPONDENCE

Duty on Advertising Matter to Canada

To the Editor:—Our friends across the border have found it necessary to charge duty on American advertising matter and have issued regulations according to which stamps in various denominations can be bought from the Commissioner of Customs at Ottawa for prepayment of this duty. A similar tax on advertising matter has been enforced for quite some time in Australia, New Zealand and South Africa, but we never dreamed of such a tax being imposed by our neighbors on this continent. We are wondering what American manufacturers think of this method of promoting business between the two countries and we would very much like to hear the opinion of other manufacturers in the United States using the mails for distribution of catalogues and advertising matter.

We have heard that the reason why Australia, New Zealand and South Africa resorted to such a reactionary method is that typographers' unions throughout these countries had in mind that literature, advertising foreign products, should be printed in the various countries instead of being imported free of duty and perhaps it was also for the purpose of protecting the colonial industries.

Aside from a very small revenue, we fail to see what benefit Canadian manufacturers or printers are going to derive from it, as we hardly believe there is any United States manufacturer who would send his advertising material to foreign countries to be printed, particularly as there is no country in the world that can duplicate American catalogue work.

The duty simply imposes upon the American manufacturers unnecessary red tape, and, if anything, would have a tendency to create ill feeling between manufacturers in the United States and their Canadian customers, because if advertising matter should happen to be mailed without prepaying the duty, we understand that "merchandise" of this kind wou'd be presented to the addressee for acceptance against a payment of duty levied on each parcel and if not accepted to be returned to the sender, causing delay and unpleasantness.

Sometimes such catalogues or printed matter have been requested by Canadian manufacturers, and while American manufacturers are willing to pay the duty, the matter will from time to time escape attention, simply because it is something out of the ordinary. The levying of this duty, therefore, is of a highly problematic value to our Canadian friends, while to American manufacturers it is nothing but unnecessary hardship. Finally, is it really consistent with modern ideas of promoting friendly intercourse between nations to take such steps? What if the United States took reprisals?

EXPORTERS.

German and Swedish Chrome Tool Steel Tubing

To the Editor:—On page 618 of your issue of September 10 you have an article in regard to German chrome tool steel tubing, such as has been used extensively for races for ball bearings. While it is true that the German supply has been shut off by the European war, we are still prepared to furnish hollow steel bars from Sweden, and are executing orders for them at the present time. Shipments can be obtained via Norway and Norwegian steamers. It has always been our contention that the Swedish product is superior to the German, on account of being made from Swedish ore and the fact that it is rolled into shape instead of being drawn. The former process gives the steel a better structure. The Swedish steel runs higher in chrome and slightly lower in carbon than the steel from which the German tubing is made.

In support of our claim for the Swedish product we would state that in order to draw high-carbon, high-chrome steel into tubes, as German makers do, it is

necessary to heat the steel to a very high temperature, which is in itself a dangerous operation on account of the possibility of overheating or burning the steel. After being heated up to the high temperature, the steel is drawn or stretched on a mandrel or plunger into the shape of tubes, and this drawing or stretching is a strain on the structure of the steel. In rolling this same grade of steel into the shape of hollow bars, it is not necessary to heat the steel up to so high a temperature, while the process of rolling from both the inside and outside condenses and refines the structure of the steel and puts it in the best possible condition.

GEORGE B. NORCROSS & CO.

CLEVELAND, OHIO, September 16, 1914.

American Conservation of Human Resources—A Contrast

To the Editor:—A recent paper having the title "Safety First" says: "This shibboleth has become a clarion call in all industrial establishments."

While the nations of Europe are engaged in killing and maiming human beings, not only on an unprecedented scale of magnitude, but revealing such fearful barbarities that it is impossible for Christian people in our peaceful land to comprehend fully this strange and awful species of sanguinary intoxication, we of the United States have been engaged in devising methods for the conservation of human life and limb in every branch of industrial occupation. Beginning in a small way a number of years ago, the idea of the responsibility of employers of labor toward employees on account of all accidents occurring in the course of their duties, together with the possibility and practicability of largely reducing these, without necessarily reducing output or increasing cost, has steadily gained ground. Today the prevention of accidents is generally recognized as a vital feature in all large manufacturing establishments where systematic records have been kept and safety devices have been installed which have reduced the risks of accident in a most amazing manner. For example: Senate Document No. 110 of the 62d Congress, Report on "Conditions of Employment in the Iron and Steel Industry in the United States" gives statistics not known to average readers, fully supporting this general statement. Under the heading "Accidents and Accident Prevention" it says: "A large steel plant was found which had records extending over a series of years. This plant employed normally about 8000 men. Individual records were available for 7750 cases of disabling accidents during the six-year period."

After defining the causes of the accidents and classifying them, it is shown, as a remarkable result of the careful study of all accidents in this establishment and of means adopted for prevention, that "the rate for all departments decreased from 300 to 135.5 per 1000 during the period, or 55.5 per cent."

The statement has been made—and there is no reason to doubt it—that at least 10,000 men sound of limb today, employees of the United States Steel Corporation, have been saved from sudden death or serious injury during the past ten years by the efficient methods that have been devised for their protection. At first such methods were regarded by the men themselves with disfavor in many cases, for it was considered a part of the day's work to "take chances." But a great change has come in this respect, and appreciation of the sanctity of human life and the value of means of safeguarding against even minor accidents in all occupations is now almost universal among employers and employees in this land of peace.

Is it not reasonable to believe that the dissemination of such enlightened ideas and their practical results must tend toward elimination in the future of all thought of or desire for destruction of human life, whether in private quarrel or in warfare of nations?

And as the United States of America has taken the lead in saving many thousands of peaceful industrial workers from premature death or sudden injury, may we not also take the lead in showing to Europe the folly and impotence of destroying that most valuable of all assets—human life—in the insane passion of war?

While these nations are engaged in killing the workers, destroying the workshops and bringing sorrow and desolation to hundreds of thousands of innocent sufferers, the way has suddenly been opened for us to supply the vast needs of the world for all manufactured as well as natural products, which we will be enabled to do largely through the conservation of our human resources, namely, our industrial people.

The future of American industries was never more brilliant than in this hour of industrial depression.

ALEX. E. OUTERBRIDGE, JR.

PHILADELPHIA, PA., September 19, 1914.

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The Shortage in Chemical Products

To the Editor:—In reply to your inquiry I would say that carbolic acid is not obtainable in this country, as our tars contain scarcely any; hence we are dependent on England and Germany. I am the largest single user of carbolic acid here, and the embargo placed on shipments by England, together with the impossibility of obtaining any from Germany, has put me in a pretty tight place. However, by massing a big gang of men in three shifts, I have erected all the machinery and apparatus for making phenol synthetically from benzol, and my plant is now working, but I shall manufacture only for my own use in the production of phonograph records. It occurs to me that there are many things we are short of in the chemical line that could be made here quickly, if some people in the trade would act—not talk.

THOMAS A. EDISON.

ORANGE, N. J., September 8, 1914.

The Iron and Metal Markets

BUSINESS STILL RECEDING

More Blast Furnaces Are Stopping

Several Rail Sales — Foreign Inquiry for Sheet Bars—Sheets and Plates Weaker

Conditions in the steel trade have not improved; rather they have grown worse. The extension of the financial embargo on business is a reminder, in some aspects, of the memorable situation of 18 years ago. But the present halt looks to no definite date for its ending, as was the case in 1896. Railroad financing supposed to have been done before the war, and that meant contracts for steel mills, practically stands as at first, with no market for bonds.

Consumers of steel had quite well provided for their wants for the remaining quarter of the year. Lately they have been slow to specify, and the expected cancellation of unspecified balances on October 1 has been no stimulant. The falling off in the operations of manufacturing consumers of iron and steel in all lines is still the outstanding fact to which steel works running schedules are being adjusted.

Prices of finished steel are scarcely an issue under present conditions. Concessions are more readily made than was the case a month ago. These are more marked in sheets, after their rapid advance in August, and in plates, which have been the weakest of the heavy products throughout the year.

Foreign trade developments have been few apart from the Steel Corporation, of whose export sales little has been given out. Large inquiries for billets and sheet bars for Great Britain, the total being put as high as 120,000 tons, are still pending, and it is probable that ultimately round tonnages of sheet bars that have been supplied by Germany will be rolled for England in the Pittsburgh district. Our London cable notes the Steel Corporation's c.i.f. quotation there of 113 shillings, or $27.49, for sheet bars. A sale of 2000 tons of open-hearth wire rods was made for export to England at about $27, Pittsburgh. Some wire nail sales have also been made to England.

Some orders for munitions and other supplies that are contraband, including horse shoes and horse shoe nails, have come from abroad, to which no detailed publicity can be given. The same is true of considerable contracts for machinery and machine tools placed here by European governments.

A few emergency rail orders have come out after weeks devoid of such business. The Chicago & Alton has bought 7200 tons and the B. & O. 1000 tons at Chicago, and the Southern Railway has placed 3200 tons with the Tennessee Company. The South Australia State Railway has ordered 6000 tons of rails in England, after getting American bids.

The structural trade suffers from the general inability to finance building. In the East 9000 tons of structural work was closed in the week, the jobs averaging about 400 tons. The United States Steel Products Company was low bidder on 4500 tons of steel for the Cristobal coaling station in Panama.

Plate mills are running out of business from car works. In work ahead the Government navy programme promises a good tonnage. Six torpedo boat destroyers will require 500 tons each, and three battleships 13,000 to 14,000 tons each.

Salem, Mass., is asking cast iron pipe companies to figure on 15,000 to 20,000 tons of pipe it will need in the spring of 1915, but which may be bought now if prices are attractive, as they are quite certain to be made.

A contract for 10,000 tons of coke a month for two years has just been placed by the New Jersey Zinc Company, prices being adjusted on a basic pig iron sliding scale.

The rapid addition of blast furnaces to the idle list tells the story of still further contraction in pig iron consumption. Three stacks have gone out in eastern Pennsylvania and New Jersey, two in Virginia, one at Cleveland and one at Chicago, and more are to be blown out soon. Foundries are melting less and less iron. Chicago reports that malleable foundries which depend on the railroads and agricultural works are running at 25 per cent. of capacity and gray iron foundries at 40 per cent.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Sept. 23, 1914.	Sept. 16, 1914.	Aug. 19, 1914.	Sept. 24, 1913.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	$14.75	$14.75	$14.75	$16.00
No. 2, Valley furnace...	13.00	13.00	13.00	14.00
No. 2 Southern, Cin'ti...	13.25	13.25	13.25	14.25
No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
No. 2, furnace, Chicago*	*13.00*	13.25	13.75	15.00
Basic, del'd, eastern Pa.	14.00	14.00	14.00	15.25
Basic, Valley furnace....	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh....	14.90	14.90	14.90	16.65
Malleable Bess., Ch'go*..	13.25	13.25	14.00	15.00
Gray forge, Pittsburgh..	13.65	13.65	13.65	14.25
L. S. charcoal, Chicago..	15.75	15.75	15.75	14.75
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh.	21.00	21.00	20.50	24.50
O.-h. billets, Pittsburgh.	21.00	21.00	20.50	24.00
O.-h. sheet bars, P'gh...	22.00	22.00	21.50	25.00
Forging billets, base, P'gh.	26.00	26.00	26.00	30.00
O.-h. billets, Phila.....	23.40	23.40	23.40	25.00
Wire rods, Pittsburgh...	26.00	26.00	25.00	27.00
Old Material, Per Gross Ton:	1914.	1914.	1914.	1913.
Iron rails, Chicago.....	12.00	12.00	12.00	14.00
Iron rails, Philadelphia..	14.00	14.00	14.00	17.50
Carwheels, Chicago.....	*10.75*	11.00	11.25	12.25
Carwheels, Philadelphia.	11.00	11.00	11.50	13.00
Heavy steel scrap, P'gh.	*11.00*	11.25	11.25	12.25
Heavy steel scrap, Phila	*10.50*	10.75	10.50	11.75
Heavy steel scrap, Ch'go	9.00	9.00	9.75	10.00
No. 1 cast, Pittsburgh...	11.50	11.50	11.50	12.75
No. 1 cast, Philadelphia.	12.00	12.00	12.00	13.00
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.50	10.50
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	1.12	1.12	1.17½	1.32½
Iron bars, Pittsburgh...	*1.15*	1.20	1.20	1.55
Iron bars, Chicago.....	*1.05*	1.07½	1.07½	1.35
Steel bars, Pittsburgh...	1.20	1.20	1.20	1.40
Steel bars, New York....	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh.	1.20	1.20	1.20	1.40
Tank plates, New York..	1.36	1.36	1.36	1.56
Beams, etc., Pittsburgh..	1.20	1.20	1.20	1.40
Beams, etc., New York..	1.36	1.36	1.36	1.56
Skelp, grooved steel, P'gh	1.20	1.20	1.20	1.35
Skelp, sheared steel, P'gh	1.25	1.25	1.25	1.45
Steel hoops, Pittsburgh..	1.30	1.30	1.30	1.60
Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	1.95	1.95	1.90	2.10
Galv. sheets, No. 28, P'gh	2.95	2.95	2.90	3.10
Wire nails, Pittsburgh...	1.60	1.60	1.55	1.65
Cut nails, Pittsburgh....	1.60	1.60	1.60	1.60
Fence wire, base, P'gh...	1.40	1.40	1.35	1.45
Barb wire, galv., P'gh...	2.00	2.00	1.95	2.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville, Per Net Ton at Oven:	Sept. 23, 1914.	Sept. 16, 1914.	Aug. 19, 1914.	Sept. 24, 1913.
Furnace coke, prompt..	*$1.60*	$1.65	$1.70	$2.15
Furnace coke, future....	1.75	1.75	1.75	2.25
Foundry coke, prompt...	*2.00*	2.10	2.25	2.90
Foundry coke, future....	*2.15*	2.25	2.35	3.00

Metals. Per lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	*12.50*	12.75	12.75	17.00
Electrolytic copper, N. Y.	*11.87½*	12.12½	12.25	16.75
Spelter, St. Louis.....	*5.20*	5.30	5.60	5.65
Spelter, New York.....	*5.35*	5.45	5.75	5.80
Lead, St. Louis.....	*3.67½*	3.70	3.70	4.60
Lead, New York.....	*3.85*	3.87½	3.87½	4.75
Tin, New York.....	**31.60**	31.35	49.00	41.85
Antimony, Hallett's, N. Y.	*10.00*	11.00	16.00	7.75
Tin plate, 100-lb. box, P'gh	*$3.30*	$3.40	$3.50	$3.50

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal on plates, shapes, etc., is 46c.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.20c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in....	.10
Gauges under 3-16 in. to and including No. 8....	.15
Gauges under No. 8 to and including No. 9....	.25
Gauges under No. 9 to and including No. 10....	.30
Gauges under No. 10 to and including No. 12..	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles 3 ft. in diameter and over.....	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in	1.00
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.20c. to 1.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909....	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, $1.40; galvanized, $1.80. Galvanized barb wire and fence staples to jobbers, $2; painted, $1.60. Wire nails to jobbers, $1.60. Woven wire fencing, 73 per cent. off list for carloads; 72 off for 1000-rod lots; 71 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized ...	2.00	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wire Rods.—Bessemer, open-hearth and chain rods, $26 to $26.50.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from April 20, 1914, and iron pipe from June 2, 1913, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	73	52½	¼ and ⅜	66	47
½	77	66½	½	65	46
¾ to 3	80	71½	½	69	56
			¾ to 2½	72	61

Lap Weld

2	77	68½	1¼	56	45
2½ to 6	79	70½	1½	67	56
7 to 12	76	65½	2	68	58
13 to 15	53	..	2½ to 4	70	61
			4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted

1 to 3, butt	78	69½	1 to 1½, butt	70	59
2, lap	75	66½	2, butt	70	59
2½ to 6, lap	77	68½	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap	68	59

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	68	57½	⅜	63	52
½	73	66½	½	67	60
¾ to 1½	77	70½	¾ to 1½	71	62
2 to 3	78	71½	2 and 2½	72	63

Lap Weld, extra strong, plain ends

2	74	65½	1½	65	59
2½ to 4	76	67½	2	66	58
4½ to 6	75	66½	2½ to 4	70	61
7 to 8	68	57½	4½ to 6	69	60
9 to 12	63	52½	7 to 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends

½	63	56½	½	57	49
¾ to 1½	66	59½	¾ to 1½	60	52
2 to 2½	68	61½	2 and 2½	62	54

Lap Weld, double extra strong, plain ends

2	64	57½	2	55	49
2½ to 4	66	59½	2½ to 4	60	54
4½ to 6	65	58½	4½ to 6	59	53
7 to 8	58	47½	7 to 8	52	42

To the large jobbing trade an additional 5 and 2½ per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from May 1, 1914, on steel and from January 2, 1914, on iron, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	62	1½ in.	45
2¼ in.	59	1¾ and 2 in.	49
2½ and 2¾ in.	65	2¼ in.	45
3 and 3¼ in.	70	2½ to 2¾ in.	54
3½ to 4½ in.	72	3 and 3¼ in.	57
5 and 6 in.	65	3½ to 4½ in.	60
7 to 13 in.	62	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points. On standard charcoal iron tubes for desirable orders the above discounts are shaded an extra 5, and occasionally two 5's by some makers.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 8 to 8	1.40 to 1.45
Nos. 9 to 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.60 to 1.65
Nos. 15 and 16	1.70 to 1.75

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.60 to 1.65
No. 12	1.60 to 1.65
Nos. 13 and 14	1.65 to 1.70
Nos. 15 and 16	1.70 to 1.75
Nos. 17 to 21	1.75 to 1.80
Nos. 22 and 24	1.80 to 1.85
Nos. 25 and 26	1.85 to 1.90
No. 27	1.90 to 1.95
No. 28	1.95 to 2.00
No. 29	2.00 to 2.05
No. 30	2.10 to 2.15

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.95 to 2.00
No. 12	2.05 to 2.10
Nos. 13 and 14	2.05 to 2.10
Nos. 15 and 16	2.20 to 2.25
Nos. 17 to 21	2.35 to 2.40
Nos. 22 and 24	2.50 to 2.55
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.10 to 3.15
No. 30	3.25 to 3.30

Pittsburgh

PITTSBURGH, PA., September 22, 1914.

Conditions in the steel trade are getting quieter. New business and specifications against contracts are showing a steady falling off. The consuming trade is well covered for the remainder of this year, and as the mills are asking higher prices on new orders buyers are holding back. Prices are fairly steady, manufacturers realizing that to lower them would not stimulate sales. The hope is expressed that by January trade will improve, the reopening of the freight rate case being regarded most favorably. Foreign inquiries are coming in quite plentifully, but so far business placed with local mills has not been large. Some shipments of rods, wire and wire nails are being made, and further export orders for these commodities are under negotiation. Higher prices have been obtained on some contracts than are being paid by domestic consumers. Reports as to the amount of foreign business being placed are exaggerated. A notable instance was the published statement that the American Steel & Wire Company had taken an order for 100 carloads of horseshoes for shipment to France and Russia. The order amounted to about five carloads.

Pig Iron.—Aside from a few small inquiries for foundry iron, ranging from 50 to 100 tons, and in two cases 500 tons, the local pig-iron market is stagnant. The inquiry of the Wheeling Mold & Foundry Company for a large tonnage of foundry iron has not been received enthusiastically by pig-iron makers, as the deliveries run two years, and none of the furnaces care to sell at present prices for such long delivery. The Cherry Valley furnace of M. A. Hanna & Co. has not yet blown in, and may not resume for some time. No. 4 stack of the Shenango Furnace Company, Sharpsville, Pa., has been banked on account of dull business. The Carnegie Steel Company is now operating 36 out of 59 furnaces. In the practical absence of sales we continue to quote as follows: Bessemer, $14; basic, $13; malleable Bessemer, $13; No. 2 foundry, $13 to $13.50; gray forge, $12.75, all at Valley furnace, with a freight rate of 90c. a ton for Cleveland or Pittsburgh delivery.

Billets and Sheet Bars.—English inquiries are in the market for 120,000 tons of sheet bars. It is believed that a good part, if not all, of this business will be taken by the United States Steel Products Company to be rolled by the Carnegie Steel Company. The latter has just made prices for a number of consumers on contracts for sheet bars for last quarter, which have been accepted, and has negotiations on with other consumers whom it supplies regularly on their entire requirements. Specifications against contracts for sheet bars are fairly active. The rail and billet bureau of the Carnegie Company reports that so far this month actual orders for billets and sheet bars sent to the mills for rolling show a slight increase over the same period in August. Some of the smaller makers would sell open-hearth sheet bars at less than $22, at mill. We quote Bessemer and open-hearth billets, $21; Bessemer and open-hearth sheet bars, $22, Pittsburgh or Youngstown mill, freight added to point of delivery. We quote forging billets at $26 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take $1 per ton extra. We quote axle billets at $24 to $25, f.o.b. Pittsburgh, depending on the order.

Ferroalloys.—Shipments of English ferromanganese are now coming forward regularly and for the time being all danger of a shortage has passed. English 80 per cent. ferromanganese is being freely offered at $80, seaboard, or $82.16 delivered in the Pittsburgh district. Consumers are not interested, believing the price will soon be lower. The Carnegie Steel Company has not yet made a sale of ferromanganese; when it has occasion to quote it is asking $100. Prices on ferrosilicon are firm, but not any higher. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; over 600 tons, $71, delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is $19; 11 per cent., $20, and 12 per cent., $21, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Steel Rails.—Few new orders are being placed for standard sections and nothing large is expected from the railroads for some months. The Carnegie Steel Company has taken 1000 tons of standard sections for a central Western road and has also received new orders and specifications in the past week for about 2500 tons of light rails. We quote standard sections of Bessemer steel rails at 1.25c. and open-hearth, 1.34c. We quote light rails, rolled from billets, as follows: 25, 30, 35, 40 and 45 lb. sections at 1.15c.; 16 and 20 lb., 1.20c.; 12 and 14 lb., 1.25c., and 8 and 10 lb., 1.30c., in carload lots, f.o.b. Pittsburgh. Rerolled light rails are being quoted at $1 and $2 a ton less than the above prices.

Structural Material.—New work is light. Several large jobs have been put off indefinitely on account of the European war and the resulting tight money market. The McClintic-Marshall Company has taken 600 tons for a new steel building for the Robinson Clay Products Company, Akron, Ohio, and the Massillon Bridge & Construction Company, about 500 tons for a new steel building for an Ohio concern. The United States Steel Products Company is low bidder on about 4500 tons of shapes and a few tons of plates for the new Cristobal coaling station at the Panama Canal, and if it gets the order the material will be rolled by the Carnegie Steel Company. We quote beams and channels up to 15 in. at 1.20c., for delivery over remainder of this year and in the first quarter of next year.

Plates.—The Jones & Laughlin Steel Company has taken 650 tons of ⅜ to ½ in. caisson plates for the Panama Canal, making nearly 12,000 tons it will have furnished for the canal. It has also taken about 200 tons of steel piling for Ohio River work. The Government will shortly start work on six torpedo boat destroyers and three battleships, two of the latter to be built in private yards and one at the New York navy yard. The destroyers will each require about 500 tons of plates, shapes and bars, and the battleships each from 13,000 to 14,000 tons of plates, shapes, deck plate and armor plate. The mills have not yet been asked to figure on this business. The Rutland Railroad has placed 100 50-ton steel hopper cars with the Standard Steel Car Company. The price on sheared plates is soft, some of the Eastern mills shading it about $1 a ton on business for Eastern delivery, absorbing part of the freight. We quote ¼-in. and heavier plates at 1.20c., f.o.b. Pittsburgh, for delivery over remainder of this year and into first quarter of next.

Steel Wheels.—New orders for steel wheels for some time have been small as so few new cars are being built. It is understood that cast-iron wheels will be used on the 100 cars for the Rutland Railroad. We quote wrought-steel car wheels as follows 33-in. engine truck wheels, $22.50; 36-in. engine truck wheels, $23.50; 33-in. tender wheels, $18.50; 36-in. passenger car and tender wheels, $21.50; 33-in. freight car wheels, $15.50, all with standard 2½-in. rims and minimum standard hubs,

usual extras applying for thicker rims and larger hubs, all f.o.b. cars, Pittsburgh.

Skelp.—Domestic new demand for skelp is light, but foreign inquiries are reported in the market for upward of 15,000 to 20,000 tons, mostly for shipment to England. A local maker has sold 2000 tons of grooved steel skelp for delivery to that country. On domestic orders we quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.25c.; grooved iron skelp, 1.55c.; sheared iron skelp, 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Rods.—We note a sale of 2000 tons of open-hearth rods made by a local mill for delivery to England at $27 or higher, f.o.b. Pittsburgh. Other inquiries are in the market for rods for foreign shipment, and it is believed considerable business of this character will be done. For domestic delivery we quote Bessemer, open-hearth and chain rods at $26, f.o.b. Pittsburgh.

Iron and Steel Bars.—The new demand for iron and steel bars is only for small lots, and mills report that specifications against contracts are slow. Most steel-bar consumers are covered over the remainder of the year at 1.15c. to 1.20c. We quote steel bars at 1.20c. for remainder of the year delivery, and common iron bars at 1.15c., f.o.b. Pittsburgh.

Sheets.—Both new demand and specifications for black and galvanized sheets have shown a falling off. Several mills state that specifications against contracts for high-grade sheets used by automobile builders are coming in freely, but from other leading consumers are quiet. While most mills are quoting 2c. for No. 28 Bessemer black and 3c. for No. 28 galvanized, consumers are covered by contracts at lower prices, and a relatively small amount of new business has been placed with the mills at 2c. and 3c. Some mills are still naming 1.95c. for No. 28 black and 2.95c. for No. 28 galvanized for prompt delivery. We quote Nos. 9 and 10 blue annealed sheets at 1.40c. to 1.45c.; No. 28 Bessemer black, 1.95c. to 2c.; No. 28 galvanized, 2.95c. to 3c., f.o.b. Pittsburgh, the lower prices being for prompt delivery and the higher prices for shipment over the next two or three months. We quote No. 28 black plate, tin mill sizes, H. R. and A., at 1.95c. to 2c.; Nos. 29 and 30, 2c. to 2.05c. The above prices are for carload and larger lots, f.o.b. Pittsburgh, jobbers charging the usual advances for small lots from store.

Tin Plate.—The season for tin plate is fast drawing to a close. As a result, operations among the mills are quieting down, the American Sheet & Tin Plate Company running this week to about 80 per cent., as against 92 per cent. last week. As a result of the decline in pig tin, prices on tin plate are easier. The American Sheet & Tin Plate Company is quoting $3.50 per base box, but several other makers are quoting $3.30 to $3.40 per base box, depending on the order, stating that little new business is coming out. We therefore quote 100-lb. 14 x 20 coke and terne plates at $3.30 to $3.50 per base box, f.o.b. maker's mill.

Wire Products.—As yet the inquiry for 5000 tons of barb wire for shipment to Russia has not been closed, but several local mills are actively bidding on it. There are also inquiries for plain and barb wire and wire nails in the market for shipment to Canada, England and other foreign countries, and it looks as though a good deal of business may be done. Contracts taken some time ago on the $1.50 basis for wire nails and $1.30 for plain wire have been pretty well cleaned up, most of the shipments now made by the mills being at $1.55 for wire nails and $1.35 for plain wire. The new demand for wire nails and wire is light, and specifications against contracts are only fair. On new orders we quote wire nails at $1.60; plain annealed wire, $1.40; galvanized barb wire and fence staples, $2; painted barb wire, $1.60, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. off for cash in 10 days. We quote steel cut nails at $1.60 to $1.65, f.o.b. Pittsburgh, in carload lots. We quote woven wire fencing at 73 per cent. off in carload lots, 72 on 1000-rod lots, and 71 on smaller lots, all f.o.b. Pittsburgh.

Nuts, Bolts and Rivets.—Most consumers of nuts and bolts are covered for remainder of the year, but are not specifying freely. The new demand for rivets is dull, as locomotive and boiler shops are running light. Prices are fairly firm, and regular discounts on nuts and bolts would be shaded on desirable orders. Discounts on nuts and bolts are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 5% off
Small carriage bolts, cut threads	80% off
Small carriage bolts, rolled threads	80 and 5% off
Large carriage bolts	75 and 5% off
Small machine bolts, cut threads	80 and 5% off
Small machine bolts, rolled threads	80 and 10% off
Large machine bolts	75 and 10% off
Machine bolts, c.p.c. & t nuts, small	80% off
Machine bolts, c.p.c. & t nuts, large	75 and 5% off
Square h.p. nuts, blank and tapped	$6.30 off list
Hexagon nuts	$7.20 off list
C.P.C. and r sq. nuts, blank and tapped	$6.00 off list
Hexagon nuts, ⅝ in. and larger	$7.20 off list
Hexagon nuts, smaller than ½ in.	$7.80 off list
C.P. plain square nuts	$5.50 off list
C.P. plain hexagon nuts	$5.90 off list
Semi-fin. hex. nuts, ½ in. or under	85, 10 & 10% off
Semi-in. hex. nuts, ⅝ in. and larger	85 & 5% off
Rivets, 7/16 x 6½, smaller & shorter	80, 10 & 5% off
Rivets, tin plated, packages	80, 10 and 5% off
Rivets, metallic tinned, packages	80, 10 and 5% off
Standard cap screws	70, 10 and 10% off
Standard set-screws	75, 10 and 10% off

Shafting.—Specifications against contracts are quiet and new demand is dull. It is not believed that more than 30 to 40 per cent. of producing capacity is active. We quote cold-rolled shafting at 66 per cent. off in carload lots, delivered in base territory, but on desirable orders an additional point would be allowed.

Hoops and Bands.—New demand is light and specifications are not heavy. We quote steel bands at 1.20c., with extras as per the steel bar card, and steel hoops at 1.30c., f.o.b. Pittsburgh, for delivery over remainder of the year.

Railroad Spikes.—This trade is in very unsatisfactory condition. The new demand is almost stagnant, and railroads are not specifying against contracts for spikes they placed early in the year. One local mill was idle last week, and is down this week, having accumulated stocks from which it can fill current orders. We quote standard sizes of railroad and boat spikes at $1.40, and small railroad and boat spikes at $1.50 per 100 lb. in carload lots, f.o.b. Pittsburgh.

Merchant Steel.—New orders are only for small lots to cover current needs and specifications are dull. Manufacturers of high grade tool steels, on which they had a good export trade, report that they expect in a short time to resume foreign shipments. Prices are weak and on small lots are about as follows: Iron finished tire, ½ x 1½ in. and larger, 1.30c., base; under ½ x 1½ in., 1.45c.; planished tire, 1.50c.; channel tire, ¾ to ⅞ and 1 in., 1.80c. to 1.90c.; 1⅛ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Standard Pipe.—The pipe trade is very dull and the mills are not running to over 30 to 40 per cent. of capacity. There is no new demand for casing or oil-well supplies, as drilling has been largely shut off in nearly all oil fields. Discounts are unchanged.

Boiler Tubes.—There is no new demand for locomotive tubes, but for merchant tubes there is a fair inquiry. The mills making tubes are not running to over 35 to 40 per cent. of capacity, and discounts are still being materially shaded.

Coke.—The New Jersey Zinc Company has placed a contract with W. Harry Brown, coke operator, for 10,000 tons per month for two years, the price to be on a sliding scale, according to prices of basic pig iron. Prices are easier. We quote best grades of blast-furnace coke for prompt shipment at $1.60 to $1.65 and on contracts for remainder of the year at nominally $1.75 to $1.85 per net ton at oven. Foundries are doing very little.

We quote standard makes of 72-hr. foundry coke at $2 to $2.10 for spot shipment, and $2.15 to $2.25 on contracts. The output of coke in the upper and lower Connellsville regions for the week ended September 12, as reported by the Connellsville Courier, was 250,955 net tons, a decrease over the previous week of nearly 17,000 tons.

Old Material.—While there are no embargoes, none of the large consumers is taking in scrap very freely. There is a fair inquiry for borings and turnings. Free offerings of heavy melting scrap at $11.25 and lower are turned down. On the other hand dealers are afraid to sell short as they say it is hard to buy material at prices now ruling. We note a sale of 400 tons of borings at $8.25 for delivery to consumer's mill in the Pittsburgh district. For delivery to consumers' mills in the Pittsburgh and nearby districts, that take the same rates of freight, prices are about as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.00 to $11.25
Compressed side and end sheet scrap	10.00 to 10.25
No. 1 foundry cast	11.50 to 11.75
No. 2 foundry cast	10.25 to 10.50
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	8.25 to 8.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.75 to 13.00
No. 1 railroad malleable stock	11.00 to 11.25
Railroad grate bars	10.25 to 10.50
Low phosphorus melting stock	14.25 to 14.50
Iron car axles	19.00 to 19.50
Steel car axles	13.50 to 14.00
Locomotive axles, steel	20.00 to 20.50
No. 1 busheling scrap	10.25 to 10.50
No. 2 busheling scrap	7.25 to 7.50
Machine shop turnings	7.75 to 8.00
Old carwheels	11.25 to 11.50
Cast-iron borings	8.25 to 8.50
†Sheet bar crop ends	12.00 to 12.25
Old iron rails	13.00 to 13.25
No. 1 railroad wrought scrap	11.50 to 11.75
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	11.25 to 11.50

†Shipping point.

Chicago

CHICAGO, ILL., September 21, 1914.

The energetic efforts of sales organizations in the canvass for business are everywhere conspicuous. It would be only truthful to say that this enterprise is but poorly rewarded. Makers of pig iron and steel are comparing their immediate situation with the leanest period in their remembrance. Their inclination to be aggressive is hampered by a prospect almost completely shrouded in uncertainty. The financial situation, while more clearly understood and perhaps less oppressive, is none the less restrictive in its influence upon the projection of new business. Steel building construction is particularly hampered and railroad operations are increasingly curtailed. An acute depression of the foundry trade prevails and the blowing out of furnaces in this district can only be considered as favorable from the standpoint of prices. Orders for about 10,000 tons of rails with track fastenings are reported and there is some business in reinforcing steel. Mill activity averages but little above 60 per cent. of capacity and it is a matter of some ingenuity to provide continuous running schedules. Some encouragement is to be had from exceptional cases of activity in the miscellaneous manufacturing lines, but the larger units of production making semi-finished iron and steel materials have been much reduced in their activities.

Pig Iron.—It is estimated that the melt of iron in the malleable foundries of this district has been reduced to 25 per cent. of normal consumption and that of gray-iron foundries to 40 per cent. It is not surprising, therefore, to find only 6 out of 12 merchant furnaces in this district in blast, with another one, Zenith, to blow out October 1. The Federal Furnace Company blew out its second stack September 17. There are reports that still other furnaces are to discontinue operation. From the standpoint of price alone, this reduction in active capacity is in the direction of supporting the market, but it is likewise the most significant indication of the state of the trade. Some few sales of very small lots are reported with prices still declining. For Southern iron $10, Birmingham, is quoted, but on this basis there is little opportunity for disposing of Southern iron in the Chicago market in competition with the Lake furnaces. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal	$15.75 to $16.75
Northern coke foundry, No. 1	13.50 to 14.00
Northern coke foundry, No. 2	13.00 to 13.50
Northern coke foundry, No. 3	12.75 to 13.25
Southern coke, No. 1 f'dry and 1 soft	14.85 to 15.10
Southern coke, No. 2 f'dry and 2 soft	14.35 to 14.60
Malleable Bessemer	13.25 to 13.75
Standard Bessemer	17.00
Basic	12.75 to 13.25
Low phosphorus	21.00 to 21.75
Jackson Co. and Ky. silvery, 6 per cent.	16.90 to 17.40
Jackson Co. and Ky. silvery, 8 per cent.	17.90 to 18.40
Jackson Co. and Ky. sil'vy, 10 per cent.	18.90 to 19.40

Rails and Track Supplies.—Rail sales, for the most part specifications against contracts, are reported for the past week approximating 10,000 tons in the aggregate. Accompanying these orders, a corresponding supply of spikes and bolts and rail joints was booked. These orders were almost entirely of an emergency character and indicate no departure from the railroad policy of curtailment. We quote standard railroad spikes at 1.50c. to 1.60c., base; track bolts with square nuts, 1.90c. to 2c., base, all in carload lots, Chicago; tie plates, $25.50 to $26, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—In no direction has there been a greater restriction of activity than in steel construction. This is, of course, directly traceable to the limitations of the financial situation. One of the Chicago steel works, whose activities normally range above the average, is facing the first shut-down of its structural and universal plate mill in many years. Fabricating shops are experiencing the leanest period that has been their lot for a long time. Contracts for fabricated steel placed in the West recently aggregate barely 1000 tons. Buying has not been of such character as to make the question of price one of importance and quotations are generally undisturbed. For mill shipment of plain shapes, Chicago delivery, we quote 1.38c.

Iron and steel jobbers have not entirely escaped the restriction of steel buying and they report a fair amount of emergency orders. We continue to quote for structural shapes out of stock 1.75c.

Plates.—The lack of railroad inquiry for cars is more pronounced and car builders find but limited need for additional material. The approaching close of the third quarter is responsible for some increase in plate specifications of miscellaneous character and for some fourth-quarter inquiry as well. We quote for Chicago delivery, from mill, 1.38c.

We quote for Chicago delivery of plates from store 1.75c.

Sheets.—The rapid decline in the price of spelter coupled with the sharp falling off in demand has weakened the position of some of the sheet producers and induced concessions of $1 to $2 a ton. While galvanized sheets primarily are affected, a sympathetic weakness in one-pass and blue annealed is reported. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.58c.; No. 28 black, 2.08c. to 2.13c.; No. 28 galvanized, 3.08c. to 3.13c.

We quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.55c.

Bars.—The expiration of third-quarter contracts in the near future is bringing out a fair volume of specifications and some inquiry of a more or less tentative nature covering fourth-quarter and first-quarter delivery. Agricultural implement specifications also are of sufficient importance to be noted. For reinforcing bars, the inquiry includes about 350 tons for the city of Chicago and a like amount for a building in Minneapolis. It is understood that a local steel mill will fur-

nish about 300 tons of hard steel bars for the reinforced flooring in the McIlvain Building, Chicago. Bar-iron sales are limited to scattered orders for rush shipment. Prices for bars show little or no change in the face of the very limited business except that 1.05c. has again been done on bar iron. We quote for mill shipments as follows: Bar iron, 1.05c. to 1.10c.; soft steel bars, 1.35c.; hard steel bars, 1.25c. to 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 50c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—The marked curtailment of building operations has had its effect on rivet sales and shipments and the situation is but little better with respect to bolts. We continue to quote from mill as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 85; cut thread, 80-5; larger sizes, 80; machine bolts up to ¾ x 4-in., rolled thread, 85-5; cut thread, 85; larger sizes, 80-5; coach screws, 85-10; hot pressed nuts, square head, $6.60 off per cwt.; hexagon, $7.60 off per cwt. Structural rivets, ½ to ¼ in., 1.58c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2.20c.; boiler rivets, 2.30c.; machine bolts up to ¾ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ⅜ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square head, $6, and hexagon, $6.70 off per cwt.

Wire Products.—Orders for wire in the first half of September fell below the very satisfactory tonnage booked in August, but there is much less complaint from this source than from most of the other finished lines. Independent interests advise that specifications for wire constitute a substantial portion of their bookings. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78; galvanized, $2.18; polished staples, $1.78; galvanized, $2.18, all Chicago.

Old Material.—The supply of scrap available for purchase has become so obviously in excess of melters' demand and prices have declined to such a low level that some of the railroads are dismissing their scrap-handling forces and are temporarily curtailing the gathering of scrap on their lines. The only list offered this week is one of 2800 tons from the Chicago, Milwaukee & St. Paul. Although transactions involving the purchase of scrap by melters are few, each purchase seems to establish a lower level of prices. There is an Eastern demand for borings. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	10.25 to 10.75
Old steel rails, less than 3 ft	10.25 to 10.50
Old carwheels	10.75 to 11.25
Heavy melting steel scrap	9.00 to 9.25
Frogs, switches and guards, cut apart	9.00 to 9.25
Shoveling steel	8.75 to 9.00
Steel axle turnings	6.75 to 7.25

Per Net Ton

Iron angles and splice bars	$11.50 to $12.00
Iron arch bars and transoms	11.50 to 11.75
Steel angle bars	8.25 to 8.75
Iron car axles	14.75 to 15.25
Steel car axles	11.25 to 11.75
No. 1 railroad wrought	8.00 to 8.25
No. 2 railroad wrought	7.75 to 8.00
Cut forge	7.75 to 8.00
Steel knuckles and couplers	9.00 to 9.50
Steel springs	9.25 to 9.75
Locomotive tires, smooth	9.00 to 9.50
Machine shop turnings	4.50 to 5.00
Cast borings	4.75 to 5.00
No. 1 busheling	6.75 to 7.00
No. 2 busheling	5.25 to 5.50
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	9.25 to 9.75
No. 1 cast scrap	9.00 to 9.50
Stove plate and light cast scrap	8.25 to 8.50
Grate bars	8.00 to 8.25
Railroad malleable	8.25 to 8.50
Agricultural malleable	7.50 to 7.75
Pipes and flues	5.75 to 6.00

Cast-Iron Pipe.—The inability to sell municipal bonds has prevented the placing of pipe orders at Toledo, Ohio; Seattle, Wash., and Tacoma, Wash. Other municipal purchases of pipe which have been in contemplation have been postponed awaiting a more favorable financial situation. An award of 400 tons of pipe at Quincy, Ill., is reported. The other business booked has consisted almost entirely of small tonnages from contractors and other miscellaneous sources. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26; 6 to 12 in., $24; 16 in. and up, $23.50, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., September 22, 1914.

The demand for materials and products continues slow in all directions, with further lessened interest in some. Quotations for plates, shapes and bars apparently have not receded from the 1.35c., Philadelphia, level and open-hearth rolling billets, despite their dullness, continue at $23.40, Philadelphia. Pig iron is quiet, though there are vague reports of buying by Delaware River pipe foundries. Ferromanganese is easier at $80 to $85, seaboard. A small transaction in wire rods has resulted here from export inquiry, but in most cases it is reported that no business has yet been done with foreign buyers. An order for 6000 tons of rails and fittings for Australia was placed in England, instead of here, because of the specifications involved.

Iron Ore.—There is no interest in iron ore. From Sweden 8720 tons arrived last week.

Pig Iron.—The market has been quiet. It is a matter of common report that some pipe iron, how much is uncertain, was bought by two Delaware river foundries, one of which was known to be inquiring for 2000 to 3000 tons. On the other hand, some of the trade regard these reports doubtfully and say they would like to see confirmation of them. They know that offers of $13.25 to $13.50, delivered, were made by buyers because they declined to accept those figures. One seller, whose sales for the week totaled about 5000 tons in lots of various sizes, admits that some pipe iron was included. Steel-making irons have been inactive, except for small lots of standard low phosphorus. Sales aggregating 930 tons of the product of a Virginia furnace, most of it No. 2 X, were made in the week ended September 19, which is a betterment over the preceding week for that particular brand. Some of this business was taken from other makers who have not come down to the bottom level now quoted. Prices generally are practically unchanged, though now and then mention is heard of $14.50 as a possibility for eastern Pennsylvania No. 2 X, but this is offset by the fact that as high as $15.25 has been obtained for some brands. The following quotations continue to be named for standard brands for early delivery in buyers' yards in this district:

Eastern Penna. No. 2 X foundry	$14.75 to $15.00
Eastern Penna. No. 2 plain	14.50 to 14.75
Virginia No. 2 X foundry	15.30 to 15.50
Virginia No. 2 plain	15.05 to 15.25
Gray forge	13.75 to 14.00
Basic	14.00
Standard low phosphorus	21.00 to 21.50

Ferroalloys.—Local sellers are asking $80 to $85, seaboard, for 80 per cent. ferromanganese, the supply of which appears to be ample to meet present demand. Last week 1644 tons arrived here from England. There is some talk of material to be had at $75, but offerings are not made openly. Dealers are of the opinion that some consumers have at least tried to sell part of the ferromanganese which they have received under contract at $38. An eastern Pennsylvania steel company which recently bought some manganese ore is a new seller in the market. Standard ferrosilicon is unchanged at $71 to $73, Pittsburgh.

Bars.—New business in steel bars has been quiet and specifications against old orders have been fair only. Makers are holding to 1.35c., Philadelphia, for this year's business and discredit rumors that lower has been done. Some railroad business remains to be placed. Foreign inquiries have continued to come along, one of these being for 750 tons of sheet bars. One of the largest eastern Pennsylvania mills has closed an order for 200 tons of wire rods for export and is figuring on a definite inquiry for about 2000 tons more. No large domestic inquiries have come out and at best the demand is no better than it was in the pre-

ceding week. Iron bars remain quiet at about 1.15c., Philadelphia, with shading possible.

Plates.—According to local sellers, the only feature in plates is that the 1.20c., Pittsburgh basis, equal to 1.35c., Philadelphia, is being held. The spotty business that is coming along, mostly involving small quantities, is only sufficient to keep the mills going at 50 to 60 per cent. of capacity and one mill shut down for the week. The foreign inquiries heretofore referred to have not yet resulted in orders.

Structural Material.—Both specifications and new business are lighter and production is limited to 50 or 60 per cent. of capacity. Desirable projects are absent, demand consisting of small and odd lots of shapes for fabricators and merchants, for which 1.35c., Philadelphia, is being obtained.

Billets.—Eastern Pennsylvania makers are figuring on export inquiries, one of which calls for 500 tons, but it cannot be learned that any resultant orders have been received. Quotations are unchanged at $23.40 for open-hearth rolling billets, with forging steel $4 to $5 a ton higher. The lower price quoted a week ago was a typographical error. The correct quotation appeared under the heading "Comparison of Prices."

Sheets.—The trade has been a trifle quieter, especially as regards new business. Quotations are 1.60c. to 1.65c., Philadelphia, on No. 10 blue annealed.

Coke.—The market continues without interest. Prompt furnace coke is obtainable at $1.70 to $1.75 per net ton at oven. Prompt foundry is about $2.25 to $2.35. Freight rates to this city from the prinicpal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—Some fair sales of wrought-iron pipe were made, after which its price declined. As a general thing, there has been but little buying and weakness is shown. In cases mills have asked that delfveries be postponed. For heavy melting steel $10.50 is now given as sellers' minimum. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$10.50 to $11.00
Old steel rails, rerolling	12.00 to 12.50
Low phosphorus heavy melting steel scrap	14.00 to 14.50
Old steel axles	14.50 to 15.00
Old iron axles (nominal)	19.00 to 19.50
Old iron rails	14.00 to 14.50
Old carwheels	11.00 to 11.50
No. 1 railroad wrought	12.00 to 12.50
Wrought-iron pipe	10.50 to 11.00
No. 1 forge fire	8.50 to 9.00
Bundled sheets	8.50 to 9.00
No. 2 light iron	5.00 to 5.50
No. 2 busheling	8.00 to 8.50
Machine shop turnings	8.50 to 8.75
Cast borings	8.50 to 9.00
No. 1 cast	12.00 to 12.50
Grate bars, railroad	8.00 to 8.50
Stove plate	8.50 to 9.00
Railroad malleable	9.00 to 9.50

Buffalo

BUFFALO, N. Y., September 22, 1914.

Pig Iron.—The market the past week has been almost lifeless, although one producing interest reports two or three orders of fair tonnage. Most producers of the district report inquiry at very low ebb. Some indications appear of concessions on the higher grades by one or two interests who have booked orders for No. 2 X at $12.75, furnace, but the majority of furnacemen are inclined to hold pretty firmly to recent price schedules. There has not been sufficient demand, however, to actually test the market. The Canadian Furnace Company, Ltd., Port Colborne, Ont., has blown out its stack, operations to be resumed with return of demand for iron. We quote as follows, last half delivery, f.o.b. furnace at Buffalo:

No. 1 foundry	$13.50 to $14.00
No. 2 X foundry	12.75 to 13.50
No. 2 plain	12.75 to 13.25
No. 3 foundry	12.75 to 13.00
Gray forge	12.50 to 13.00
Malleable	13.00 to 13.50
Basic	14.00
Charcoal, regular brands and analysis	16.25 to 17.25
Charcoal, special brands and analysis	20.50

Finished Iron and Steel.—Selling agencies report quite satisfactory totals in most lines as far as specifications on contracts are concerned, but only a comparatively small amount of new business has been placed and very few forward contracts made. Some sellers report quite a little increase in demand for steel bars, although without much actual business resulting. Considerable improvement in sentiment is noted in iron and steel circles in Canada, and it is stated a number of construction projects, particularly in the line of public works, which were held up temporarily, are being revived. Some inquiry for export business through Canadian branch houses is also being received on this side of the boundary. In fabricated structural lines but little new business is on the boards and quite a number of contemplated building projects have been postponed until spring. Some small contracts for fabricated work have been placed and bids for the drill shed at Cornell University, Ithaca, about 1000 tons, will be taken early next month.

Old Material.—A few sales are being made, particularly borings and turnings. There is a short supply in these two commodities and stock is picked up as rapidly as produced; prices are slightly firmer. In most commodities there has not been sufficient business to accurately gauge prices, but dealers report no change for the week. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$10.25 to $10.50
Low phosphorus steel	14.00 to 14.50
Boiler plate sheared	11.50 to 12.00
No. 1 railroad wrought scrap	10.00 to 10.50
No. 1 railroad and machinery cast	10.25 to 10.75
Old steel axles	12.00 to 12.50
Old iron axles	17.50 to 18.00
Old carwheels	10.50 to 11.00
Railroad malleable	9.00 to 9.50
Machine shop turnings	5.50 to 6.00
Heavy axle turnings	7.50 to 8.25
Clean cast borings	6.00 to 6.50
Old iron rails	12.25 to 12.75
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	9.00 to 9.75
Wrought pipe	7.50 to 8.00
Bundled sheet scrap	6.25 to 6.50
No. 1 busheling scrap	8.25 to 8.75
No. 2 busheling scrap	5.75 to 6.25
Bundled tin scrap	10.50

Cleveland

CLEVELAND, OHIO, September 22, 1914.

Iron Ore.—Several small lot sales aggregating about 40,000 tons were made in the week to fill out requirements until next spring. No speculative buying is reported. Vessel men are experiencing more difficulty in getting ore cargoes and some boats now running will not have enough to keep them in operation through October. It is expected that shipments will be well cleaned up by November 1. We quote prices as follows: Old range Bessemer, $3.75; Mesaba Bessemer, $3.50; old range non-Bessemer, $3; Mesaba non Bessemer, $2.85.

Pig Iron.—The market is practically lifeless. Sales are limited to an occasional car lot and no new inquiries are pending. With the present limited foundry melt, most consumers have under contract all the iron they will need for the remainder of the year. In contrast with the extreme dullness in this immediate territory, one lake furnace interest reports an improvement in the demand for small lots, having made sales in the week aggregating about 2000 tons. With not enough business to test the market, prices are unchanged. No business in southern iron is reported. The Cleveland Furnace Company blew out its No. 1 furnace to-day. This furnace has been running on basic iron and was operated while the company's No. 2 stack was out of blast for re-lining, the latter furnace having been blown in again last month. We quote delivered Cleveland as follows:

Bessemer	$14.90
Basic	$13.75 to 13.90
Northern No. 2 foundry	13.75
Southern No. 2 foundry	14.60
Gray forge	13.25
Jackson Co. silvery, 8 per cent. silicon	17.55
Standard low phosphorus, Valley furnace	20.50

Coke.—The market is very dull and prices are weak. Standard furnace coke is freely quoted at $1.65 for spot shipment and it is stated that some makers will

sell at that price for the last quarter. Standard Connellsville foundry coke is quoted at $2.25 to $2.50 per net ton at oven.

Finished Iron and Steel.—Dullness continues. Some of the mill agents report a little improvement in specifications, their customers taking about all their monthly allotment of steel, but others will have considerable tonnage to cancel on October 1. Prices are firm at 1.20c., Pittsburgh, on steel bars and structural material, but some of the mills outside of the Pittsburgh district are quoting plates at 1.15c. There is a fair demand for steel bars for reinforcing work. The demand for structural material is falling off and no new inquiries have come out. While some building work has been held up indefinitely, two or three buildings will be placed as soon as plans can be prepared. Considerable small municipal work has been placed recently and several Ohio fabricating shops are well filled with work for the remainder of the year. Bids will be taken this week for completing the sub-structure of the Clark Avenue bridge, Cleveland, which will require a small tonnage of steel piling and reinforcing bars. Other municipal requirements include about 70 tons of steel pipe for which bids were received to-day. Specifications from the implement trade are unusually light. New demand for sheets is dull, but prices are firm. Most mills are adhering to 2c. for No. 28 black, 3c. for No. 28 galvanized and 1.45c. to 1.50c. for blue annealed. The demand for wire products is not active, but a moderate volume of orders is coming from Canada, presumably for export to England. Bar iron is not active. We quote iron bars at 1.20c. to 1.25c. for Cleveland delivery. Stock prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues light and prices are not firm. Rivet consumers are specifying for smaller lots than usual. Rivet prices are firm at 1.50c. for structural and 1.60c. for boiler. We quote discounts as follows: Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 75 and 15 per cent.; machine bolts with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 80 and 25 per cent.; cut thread, 80 and 20 per cent.; larger or longer, 80 per cent.; coach and lag screws, 80 and 25 per cent.; square h. p. nuts, blank or tapped, $6.30 off; hexagon h. p. nuts, blank or tapped, $7.20 off; c. p. c. and t. square nuts, blank or tapped, $6 off; hexagon, ⅝ in. and larger, $7.20 off; 9/16 in. and smaller, $7.80 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10 and 5 per cent.; 9/16 in. and smaller, 85, 10, 10 and 5 per cent.

Old Material.—Transactions for the most part are limited to the sale of small lots that dealers are anxious to dispose of quickly, these going at price concessions. Local mills are offering dealers only $9.75 for heavy melting yard steel, but new heavy melting stock is held at $10 to $10.25. Valley mills are entirely out of the market. Dealers' prices, f.o.b. Cleveland, are as follows:

Per Gross Ton

Old steel rails, rerolling	$11.50 to $12.00
Old iron rails	12.50 to 13.00
Steel car axles	14.00 to 14.50
Heavy melting steel	10.00 to 10.25
Old carwheels	10.75 to 11.00
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	8.50 to 9.00
Railroad malleable	10.25 to 10.50
Light bundled sheet scrap	7.50 to 8.00

Per Net Ton

Iron car axles	$17.00 to $17.25
Cast borings	5.75 to 6.00
Iron and steel turnings and drillings	5.25 to 5.50
Steel axle turnings	6.75 to 7.25
No. 1 busheling, new	8.25 to 8.50
No. 1 busheling, old	8.25
No. 1 railroad wrought	9.50 to 10.00
No. 1 cast	10.50 to 10.75
Stove plate	7.50 to 8.00

Boston

BOSTON, MASS., September 22, 1914.

Old Material.—The market has changed but little in the past week. The dealers here express confidence that present prices are at rock bottom, and await a greater demand and a rising market. A prominent dealer says that existing stocks will be stored for future demand if necessary. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. per ton more than dealers' prices.

Heavy melting steel	$8.50 to $8.75
Low phosphorus steel	13.75 to 14.75
Old steel axles	13.25 to 13.75
Old iron axles	21.25 to 21.75
Mixed shafting	12.00 to 12.25
No. 1 wrought and soft steel	9.00 to 9.25
Skeleton (bundled)	5.50 to 5.75
Wrought-iron pipe	8.00 to 8.25
Cotton ties (bundled)	6.25 to 6.50
No. 2 light	3.75 to 4.25
Wrought turnings	5.00 to 5.50
Cast borings	5.25 to 5.75
Machinery cast	11.25 to 11.50
Malleable	8.00 to 8.25
Stove plate	7.75 to 8.00
Grate bars	5.25 to 5.50

Cincinnati

CINCINNATI, OHIO, September 23, 1914 (—*(By Wire.)*

Pig Iron.—Although it is understood that there has been an improvement in the machinery trade, mostly due to foreign orders, the nearby foundries have not yet been benefited to any appreciable extent. The stove makers, however, are preparing for a busy season and as soon as cooler weather sets in they expect a rush of orders; hence they are practically working their plants to full capacity. Sales of foundry iron continue to be carload quantities and the largest of those reported covers 300 tons for a local melter to be shipped this year. This sale was made at $10.25, Birmingham basis, which figure is considered the ruling quotation, although there is yet considerable ten-dollar iron to be obtained. Southern Ohio furnaces are not endeavoring to get more than $13, Ironton, for last-quarter shipment, as competition from other producing centers precludes any successful attempt to advance the price above that basis. It is reported that two melters of basic iron in this territory will soon come into the market for a first-half supply, but so far no open quotations have been made on either foundry or basic for shipment beyond January 1. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$13.75 to $14.25
Southern coke, No. 2 f'dry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern No. 4 foundry	12.25 to 12.75
Southern gray forge	11.75 to 12.25
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.20 to 15.70
Southern Ohio coke, No. 2	14.20 to 14.70
Southern Ohio coke, No. 3	13.95 to 14.20
Southern Ohio malleable Bessemer	14.20
Basic, Northern	14.45 to 14.95
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(By Mail)

Coke.—No indications appear of any change from the protracted dullness. Shipments on contracts for furnace and foundry grades are not heavy and the warm weather has not stimulated the demand for domestic coke. We continue our quotations of $1.75 to $2 per net ton at oven for 48-hr. coke and from $2.25 to $2.50 for 72-hr. brands. A few special brands are held around $2.60.

Finished Material.—A few fill-in orders for small structural shapes have been placed. The favorable season has enabled building operations to be carried on at a more rapid rate than was expected, thus bringing out some spot business for reinforcing concrete bars. Shipments on contracts are also better. The situation with the sheet mills continues very encouraging. While no future contract business is sought, a large number of inquiries have been received for material to be shipped through the next three or four months. We quote No. 28 black sheets at 2.15c., Cincinnati, or Newport, Ky., and No. 28 galvanized sheets at 3.15c. Local store prices on steel bars and structural shapes are unchanged at 1.80c. to 1.85c.

The demand for hoops and bands is stationary, but the outlook is said to be more encouraging than for some time.

Old Material.—Practically all quotations have been reduced. This is said to be due to the large amount of scrap material held by both sellers and buyers, coupled with the very limited demand from consumers. The rolling mills have a large supply on hand or contracted for, and there are no indications of an improvement in the situation. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton

Bundled sheet scraps	$6.25 to $6.75
Old iron rails	11.00 to 11.50
Relaying rails, 50 lb. and up	19.75 to 20.25
Rerolling steel rails	10.00 to 10.50
Melting steel rails	8.75 to 9.25
Old carwheels	9.75 to 10.25

Per Net Ton

No. 1 railroad wrought	$8.00 to $8.50
Cast borings	4.00 to 4.50
Steel turnings	4.00 to 4.50
Railroad cast scrap	9.25 to 9.75
No. 1 machinery cast scrap	10.00 to 10.25
Burnt scrap	6.00 to 6.50
Old iron axles	14.50 to 15.00
Locomotive tires (smooth inside)	9.25 to 9.75
Pipes and flues	6.00 to 6.50
Malleable and steel scrap	7.00 to 7.25
Railroad tank and sheet scrap	5.00 to 5.50

Birmingham

BIRMINGHAM, ALA., Sept. 21, 1914.

Pig Iron.—The Birmingham market is in a state of stagnation. Even inquiries are nil. The only sales reported are small amounts at $10.25 in strictly home territory. One interest still quotes iron at $10, but with practically none to offer. Most of the others quote $10.25. One, whose iron sells at a premium, still holds for $10.50, with one or two small sales made. Charcoal iron is now quoted at $23.50 to $24, with scattering sales here and there. The output has not been increased. There will be a decrease this month of the home consumption of steel-making irons, owing to a let-up in rail making, but otherwise the steel situation continues to be as good as in August when it picked up considerably. Stocks of iron appear to have increased. The report of the Alabama Car Service Association would indicate this, the cars handled in August being reported at 69,000 as compared with 76,000 in July and 88,000 in August, 1913. All freight movements have declined, but the decrease is chargeable mostly to pig iron, steel, coke and coal. We quote, per gross ton, f.o.b. cars at Birmingham furnaces, as follows:

No. 1 foundry and soft	$10.50 to $11.00
No. 2 foundry and soft	10.00 to 10.50
No. 3 foundry	9.50 to 10.00
No. 4 foundry	9.25 to 9.75
Gray forge	9.00 to 9.50
Basic	10.00 to 10.25
Charcoal	23.50 to 24.00

Cast-Iron Pipe.—The Southern pipe makers are more seriously exercised by the actual shipping of Northern pipe by New York steamship lines to the Pacific coast via the Panama Canal than they were at the prospect. The past week a large San Diego contract, which prior to this time was bound to come to this district, went to the Northeast and the pipe will be delivered at $6 per ton as compared with $13 per ton, all rail, from Birmingham. The South has done a yearly business of 60,000 tons on the coast. The railroads interested say they are "in touch with the situation," but they have done nothing to rearrange the rate, and the business is leaving the district. Water-pipe makers are working at 85 per cent. of capacity and sanitary pipe factories doing about as well. We quote, per net ton, f.o.b. pipe shop yards: 4 in., $20; 6 in. and upward, $18, with $1 added for gas pipe.

Coal and Coke.—The coal trade is still more quiet. Vehement protest has been made to the State Railroad Commission against a proposed raise in rates of 33 1-3 to 40 per cent. from mines to Birmingham and adjacent territory. Coke holds its own very well under the limited output, which is taken care of. We quote, per net ton, f.o.b. oven: Furnace coke, $2.75 to $3; foundry, $3.25 to $3.65.

Old Material.—Beyond a light movement in light cast and stove plate there is no business. We quote nominally, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	$14.50 to $15.00
Old steel axles	14.50 to 15.00
Old iron rails	13.00 to 13.50
No. 1 railroad wrought	10.00 to 11.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	9.00 to 10.00
No. 2 country wrought	8.00 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	8.00 to 8.50
Tram carwheels	9.50 to 10.00
Standard carwheels	10.50 to 11.00
Stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, MO., September 21, 1914.

Pig Iron.—Demand continues somewhat widely spread and for small lots. The aggregate sales for the week have been probably 1500 to 2000 tons. There are some signs of improvement in the stove foundry section, largely due to conditions in the grain growing sections.

Coke.—Coke has been handled in only carload lots orders. By-product coke is selling for St. Louis delivery at about Connellsville prices plus $2.80 freight rate.

Finished Iron and Steel.—Orders are evidently for immediate use, as indicated by quantity and urgency of shipment. There is some improvement in demand from stove manufacturers using sheets, etc., and from the agricultural implement houses which are feeling improvement because of high prices for grains in the west and northwest. From the cotton growing sections reports of slow improvement are being received. For material in warehouse prices are: Soft steel bars, 1.70c.; structural steel, 1.80c.; tank plates, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black box annealed, cold rolled, 2.55c.; No. 28, galvanized sheets, black sheet gauge, 3.55c.

Old Material.—Relaying rails show some life, but without supplies to meet demand. Some of the east side steel mills are hopeful of getting by the first of October without closing, but this feeling is not sufficiently strong to be reflected in the scrap market prices. Lists out last week went at low prices and in some cases it is understood that the offering roads failed to close on a considerable proportion offered. We quote dealers' prices f.o.b. St. Louis as follows:

Per Gross Ton

Old iron rails	$11.00 to $11.25
Old steel rails, rerolling	11.25 to 11.50
Old steel rails, less than 3 feet	10.50 to 10.75
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	11.00 to 11.25
No. 1 railroad heavy melting steel scrap	10.00 to 10.25
Shoveling steel	8.00 to 8.75
Frogs, switches and guards, cut apart	10.00 to 10.25
Bundled sheet scrap	5.00 to 5.25

Per Net Ton

Iron angle bars	$10.00 to $10.50
Steel angle bars	8.75 to 9.00
Iron car axles	16.75 to 17.25
Steel car axles	11.75 to 12.25
Wrought arch bars and transoms	11.00 to 11.50
No. 1 railroad wrought	8.00 to 8.25
No. 2 railroad wrought	8.00 to 8.25
Railroad springs	9.25 to 9.50
Steel couplers and knuckles	8.75 to 9.00
Locomotive tires, 42 in. and over, smooth	8.75 to 9.25
No. 1 dealers' forge	7.75 to 8.00
Mixed borings	4.00 to 4.25
No. 1 busheling	7.25 to 7.50
No. 1 boilers, cut to sheets and rings	5.75 to 6.25
No. 1 cast scrap	9.50 to 10.00
Stove plate and light cast scrap	8.25 to 8.75
Railroad malleable	8.00 to 8.25
Agricultural malleable	7.50 to 8.00
Pipes and flues	5.75 to 6.25
Railroad sheet and tank scrap	5.75 to 6.00
Railroad grate bars	7.25 to 7.50
Machine shop turnings	5.00 to 5.25

The Colonial Crayon Company, Akron, Ohio, has arranged with C. K. Turner & Son, 116 Broad street, New York City, to act as its export representatives. The company manufactures white and colored crayons of every description.

New York

NEW YORK, September 22, 1914.

Pig Iron.—Foundry operations are on a smaller scale, judging from the shipments of pig iron from furnaces and the scanty buying. One inquiry for 200 tons has come out in New Jersey and Eastern pig iron offices have been asked for prices on several hundred tons of standard Bessemer iron. The recent inquiries from abroad for several thousand tons of low-phosphorus pig iron came through importing houses and appear to be in part for the purpose of locating prices. Pig iron production in eastern Pennsylvania is being curtailed. One Warwick furnace has gone out, and Leesport and Musconetcong have been blown out since the opening of the month. Low Moor furnace in Virginia stopped last week, and another Virginia furnace is going out this week. Virginia makers are quoting $12.50 for No. 2 X foundry iron, but very little Virginia iron is being taken and the same is true of Alabama iron. But for the pipe founders the Eastern market would be quite bare of transactions. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $14.75 to $15; No. 2 X, $14.25 to $14.50; No. 2 plain, $14 to $14.25. Southern iron is quoted at $14.75 to $15 for No. 1 and $14.25 to $14.50 for No. 2.

Ferroalloys.—English ferromanganese is arriving at the rate of 3000 to 4000 tons a week, and receipts for the month have been about 10,000 tons. The makers are not catching up on arrears, but are now delivering at nearly the contract rate. The usual quotation is $80 at Baltimore. Rumors of a lower price seem to be based on resale offers of about 250 tons, on some of which $75 was quoted. Ferrosilicon, in the absence of transactions, is quoted at the previous range of prices, $71 to $73, Pittsburgh, for 50 per cent.

Finished Iron and Steel.—Not only is there a cessation in new buying but a decided drop has occurred in specifications on contracts with the result that mills are averaging in operation about 50 per cent. of capacity, with little to check a rapid diminution in the scale of operations. Prices in the main are of course not tested, but are apparently well held, the point being that no volume involved is sufficient at any price to have any bearing on meeting overhead charges. While views are general that the most trying times will not be of long duration and that then there will be a gradual betterment, few expect a very favorable situation this year or, indeed, in some quarters, before spring. There are many who consider the situation the worst for over 20 years, going back to the time of the last severe panic. Not much new work was learned of in fabricated structures, but there are a number of fair sized projects that are likely soon to be closed, including among others already mentioned 1500 tons for a filter house for the American Sugar Refining Company, Brooklyn, 300 tons for the Lehigh & New England, and some 5600 tons for New York subway work on which bids go in October 6 and October 9. The railroad car builders are, however, practically not figuring on anything. In bar iron prices are held firmly, and as intimated last week, one producer is now demanding 1.20c. at mill for anything but prompt business. In a recent inquiry for about 6000 lb. of large size bar iron, 3½ x 3 to 3½ x 5 in., the base prices quoted ranged from 1.20c. at mill to over 2.50c. The leading structural awards are as follows: 1200 tons for Brook Brothers to Hay Foundry & Iron Works; 1800 tons for sections J and K, Metropolitan Museum of Art, to the Hedden Iron Construction Company; 800 tons, apartment house, Fifty-fourth street and Park avenue, to the Passaic Steel Company; 400 tons for a loft at East Sixteenth street, to the Hay Foundry & Iron Works; 300 tons for a theater at Syracuse, N. Y., to Harris, Silvers, Baker Company; 300 tons for the Victor Talking Machine Company, Camden, N. J., and 350 tons for the Southern high school in Philadelphia, both to the American Bridge Company, which also has taken 250 tons for a power house at Montague City, Mass., and 900 tons for a bridge, Van Buren, Me., to the Dominion Bridge Company. Some of the other projects closed include 400 tons for the United Gas Improvement Company, Providence; 250 tons for a boiler house, Susquehanna Coal Company; 400 tons for a bridge, Pennsylvania Railroad, Wilmerding, Pa.; 200 tons for a city bridge, Philadelphia, and 1500 tons for 11 bridges for the Pennsylvania. We quote mill shipments of steel bars, plates and shapes at 1.20c., Pittsburgh, or 1.36c., New York, and iron bars at 1.25c. to 1.30c., New York. For lots from store we quote iron and steel bars at 1.80c. to 1.85c., New York, and plate and structural material at 1.85c. to 1.90c.

Cast-Iron Pipe.—Salem, Mass., opened bids September 19 on about 700 tons of 6 to 16-in. pipe to cover immediate needs of that portion of the city visited a short time ago by an extensive conflagration. The same city contemplates the purchase of a very heavy quantity of pipe for spring delivery, perhaps 15,000 to 20,000 tons. It may be bought this fall or possibly not until spring, depending upon a decision regarding the most favorable time to make the purchase. Nothing further of any importance is in sight in connection with public lettings. The Standard Cast Iron Pipe & Foundry Company was the successful bidder, September 15, on 1000 tons of 8-in. for the commissioners of the District of Columbia, at Washington, D. C. Its bid was $19.58 delivered, the freight rate from the foundry being reported to be $2. Inquiry from private buyers is fully as heavy as usual at this season, if not more so. Prices show no improvement. Carload lots of 6-in. are quoted at $20.50 to $21, per net ton, tidewater.

Old Material.—Some sales were made in the past week to rolling mills in eastern Pennsylvania, and a few foundries bought small quantities of cast scrap but nothing transpired in steel scrap. Dealers now report their utter inability to secure any new business, the market being stagnant. Among the sales of the week was a quantity of old iron car axles at $17.50, delivered to a consumer in eastern Pennsylvania. Dealers' quotations are as follows, per gross ton, New York:

Old girder and T rails for melting	$8.00 to	$8.50
Heavy melting steel scrap	8.00 to	8.50
Relaying rails	20.50 to	21.00
Rerolling rails	10.25 to	10.75
Iron car axles	15.50 to	16.00
Steel car axles	11.75 to	12.25
No. 1 railroad wrought	10.00 to	10.50
Wrought-iron track scrap	9.00 to	9.50
No. 1 yard wrought, long	8.25 to	8.75
No. 1 yard wrought, short	8.00 to	8.50
Light iron	3.25 to	3.50
Cast borings	6.25 to	6.75
Wrought turnings	6.00 to	6.50
Wrought pipe	8.00 to	8.50
Carwheels	9.50 to	10.00
No. 1 heavy cast, broken up	10.25 to	10.75
Stove plate	7.75 to	8.25
Locomotive grate bars	6.50 to	7.00
Malleable cast	7.50 to	8.00

British Steel Trade Hopeful

Hematite Pig in Good Demand—More Furnaces Blowing—Steel Sellers Less Rigid

(By Cable)

LONDON, ENGLAND, September 23, 1914.

The output of foundry pig iron is still ahead of the demand and some adjustment will probably be necessary. Hematite pig, however, is in pretty good demand and since the war several extra furnaces have been lighted. Active furnaces in the three districts total 158, against 195 a year ago. Stocks of pig iron in Connal's stores are 99,930 tons, against 98,216 tons last week. Finished iron is less active, but not quotably changed. Sellers of semi-finished steel are more ready to quote and less rigid in their ideas. The Steel Corporation quotes 113s. ($27.49), including cost, freight and insurance, for sheet bars. Finished steel prices are barely maintained, but makers generally are fairly confident, gradually finding a new market basis. Such quotations as are available are as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 12s. 10½d. ($3.13), against 13s. ($3.16) last week.

Cleveland pig iron warrants (Tuesday), 51s. ($12.41), against 51s. ½d. ($12.42) last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 51s. 6d. ($12.53), against 51s. 4½d. ($12.50) last week.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 10s. ($46.22).

Steel ship plates, Scotch, delivered local yards, £7 ($34.06).

Steel rails, export, f.o.b. works' port, £6 5s. ($30.41).

Hematite pig iron, f.o.b. Tees, 67s. ($16.30), against 67s. 6d. ($16.42) last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, £5 2s. 6d. ($24.94) against £5 5s. to £5 10s. ($25.55 to $26.76) last week.

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £6 15s. ($32.84), against £7 ($34.06) last week.

Steel bars, export, f.o.b. Clyde, £7 2s. 6d. ($34.67).

Metal Market

NEW YORK, September 23, 1914.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Sept.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
16	12.75	12.00	31.25	3.85	3.67½	5.45	5.30
17	12.75	12.00	31.35	3.85	3.67½	5.40	5.25
18	12.50	11.87½	31.65	3.85	3.67½	5.40	5.25
19	12.50	11.87½	....	3.85	3.67½	5.40	5.25
21	12.50	11.87½	31.87½	3.85	3.67½	5.35	5.20
22	12.50	11.87½	31.60	3.85	3.67½	5.35	5.20

Small sales of electrolytic copper have been made, but quotations are lower. Tin advanced during a flurry in futures, then became easier. Lead is dull and lower. Spelter continues to decline despite more active export inquiry. Antimony is weaker in a dull market.

New York

Copper.—In the past few days there have been sales of electrolytic at 12c., 30 days, delivered, equal to 11.87½c., cash, New York. These sales, it is asserted, would be but a drop in the bucket in normal times, but they are encouraging inasmuch as they are the first show of activity in many weeks. Some sellers are not willing to concede that the price has dropped below 12c., even on cash business, and quote 12.12½c. full terms, at the same time admitting that a desirable order could be placed at the low figure. Prime Lake copper continues far away from its usual price relation to electrolytic. Prime Lake was offered yesterday at 12.50c. Its strength is due at least in part to excellent sales which have been made to ammunition makers. The exports of copper this month total 11,897 tons. It is still impossible to give London quotations of copper and other metals.

Tin.—There was a flurry of activity in the latter part of last week, particularly on September 17 and 18, when 700 to 800 tons were dealt in, according to estimate, most of the business being in future deliveries, some running ahead to January. This week demand has slackened again. Spot business has been light. The tapering off in demand for futures with consumers continuing to show little interest in spot caused the market to decline a few points and yesterday the quotation was 31.60c. for prompt delivery metal. With regard to the trading in futures some of the trade declares itself puzzled as it is understood that these contracts are not on a guaranteed basis. Incidentally, there still remains uncertainty as to future shipment from the East which is augmented by the recent activity of German warships in Indian waters that may have an adverse effect on both ocean freights and insurance. Advices from London indicate a rather firm market there. The supply immediately available here is plentiful and consumers know it. Most of the tin now coming here is from London warehouses. Arrivals this month total 3703 tons and there is afloat 1165 tons.

Lead.—The market is dull and in the West there is greater weakness. Quotations are 3.85c., New York, and 3.67½c., St. Louis. In London there is an excess in the supply of lead because of the divergence to England of metal which had been intended for the Continent. A London letter recently received states that lead has declined from £23 to about £18 10s.

Spelter.—The domestic demand continues light and prices have declined until yesterday 5.35c., New York, and 5.20c., St. Louis, were quoted. With the lower prices there has come a resumption of foreign inquiry and buying, but it is not heavy enough by any means to offset the light domestic requirement.

Antimony.—Quotations show considerable variance in a market that is dull. Cookson's can be had at 11c., Hallett's at 10c. and other grades at about 9c. to 9½c., all of these prices being about 1c. under the import price of to-day. There is but little consumption, with plenty of low-priced metal to meet such needs as exist.

Old Metals.—The demand shows no improvement. Dealers' selling prices are nominally unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.50 to 11.00
Brass, heavy	8.50 to 8.75
Brass, light	6.25 to 6.50
Heavy machine composition	11.50 to 11.75
Clean brass turnings	8.25 to 8.50
Composition turnings	9.75 to 10.00
Lead, heavy	3.60
Lead, tea	3.40
Zinc scrap	4.50

Chicago

SEPTEMBER 21.—Some concessions have been made in copper, but as a rule the weakness shown has developed little business. A sharp decline with a corresponding recovery marked the course of tin prices during the week. Independent interests are making some concessions in lead. Spelter continues to decline and sales in large quantities have been made at Chicago at 5.25c. Other quotations as low as 5.17½c., St. Louis, are reported. We quote as follows: Casting copper, 12.25c. to 12.50c.; Lake copper, 12.50c. to 12.75c., for prompt shipment; small lots, ⅛c. to ¼c. higher; pig tin, carloads, 32.50c.; small lots, 35c.; lead, desilverized, 3.75c. to 3.85c., and corroding, 4.10c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.20c. to 5.25c.; Cookson's antimony, 14c. for cask lots; other grades, 11c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 11c.; copper bottoms, 9.75c.; copper clips, 10.25c.; red brass, 10c.; yellow brass, 7.50c.; lead pipe, 3.30c.; zinc, 3.50c.; pewter, No. 1, 23c.; tinfoil, 27c.; block tin pipe, 29c.

St. Louis

SEPTEMBER 21.—Non-ferrous metals have been in a rather stagnant state the past week, with very little business moving. Lead is quoted to-day at about 3.70c.; spelter, about 5.30c.; tin, 34c.; Lake copper, 13.25c.; electrolytic copper, 13.15c.; Cookson's antimony, 13c. In the Joplin ore market prices were depressed, with some lots selling as low as $42 per ton and the top price for the choicest $47. On calamine the basis prices were $23 to $24, with the best settlement $28. Lead ore was quiet at $46 for 80 per cent. Miscellaneous scrap metals are quoted as follows: Lead, 3c.; tea lead, 3c.; zinc, 3c.; pewter, 20c.; tinfoil, 29c.; light brass, 5c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8.50c.; heavy copper and copper wire, 10c.

Iron and Industrial Stocks

NEW YORK, September 23, 1914.

Again it is necessary to record the passage of a week without authoritative quotations on stocks, the New York Stock Exchange being still closed. Sentiment in favor of reopening the Exchange is growing, and it appears possible that this may occur within the near future, possibly with trade restricted to certain bonds and stocks in which liquidation cannot be serious.

Dividends

The General Motors Company, regular semi-annual, 3½ per cent., on the preferred stock, payable November 1.

The Taylor-Wharton Iron & Steel Company, regular

semi-annual, 4 per cent., on the common stock, payable October 1.

The American Seeding Machine Company, regular quarterly, 1½ per cent. on the preferred and 1 per cent. on the common stock, both payable October 15.

The Brier Hill Steel Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 1.

The Trumbull Steel Company, 1¾ per cent. on the preferred stock, payable October 1.

The United Engineering & Foundry Company, 1¾ per cent. on the preferred stock, payable October 1.

The Youngstown Iron & Steel Company, regular quarterly, 2 per cent. on the preferred stock, payable October 1.

The Sharon Steel Hoop Company, regular quarterly, 1¾ per cent., payable October 1.

The Youngstown Sheet & Tube Company, regular quarterly, 1¾ per cent. on the preferred and 2 per cent. on the common stock, both payable October 1.

The International Harvester Company, regular quarterly, 1¼ per cent. on the common stock, payable October 15.

The International Harvester Corporation has passed the regular quarterly, which would have been payable October 15, because its business has been brought to a standstill by the European war. This company handles all the foreign business formerly conducted by the International Harvester Company.

The Crucible Steel Company of America has deferred action on the quarterly 1¾ per cent. dividend on the preferred stock owing to trade conditions as result of the European war. The board of directors decided that the only proper policy to pursue at this time is to conserve in every way possible the working capital and cash resources of the company and to protect its credits until the effect of the war is more clearly determined.

The Electric Storage Battery Company, regular quarterly, 1 per cent. each on the common and preferred stocks, both payable October 1.

The American Type Founders Company, regular quarterly, 1¾ per cent. on the preferred and 1 per cent. on the common stock, both payable October 13.

The Willys-Overland Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 1.

The Nova Scotia Steel & Coal Company has passed the usual quarterly dividends on the preferred and common stocks.

Illinois was third among the States of the Union in 1913 in the value of its mineral production, according to figures of the United States Geological Survey, compiled in co-operation with the Illinois State Survey. In coal production it is exceeded only by Pennsylvania and West Virginia, and in the production of petroleum only by California and Oklahoma. In the manufacture of clay products Illinois ranks fourth. The value of the mineral production of Illinois in 1913 was $131,825,221, of which the coal mines contributed $70,313,605, or 53 per cent. In 1912 the value of the total mineral production was $123,068,867.

Samuel Fox & Co., New York, Inc., is the name of a new corporation which has taken over the business and assets of the copartnership, now dissolved, between Alexander Muir and Arthur Chester Davidson, under the style of Muir-Davidson Steel Company, 44 Cliff street, New York. Alexander Muir is president of the new corporation and will act as its general manager in the conduct of its business, which will continue to be carried on at 44 Cliff street, including the general agency in the United States and Canada for Samuel Fox & Co., Ltd., steel manufacturers of Sheffield, England.

The Atlas Press Company is successor to the G. T. Eames Company, manufacturer of Eames compound mandrel presses, 314 North Park street, Kalamazoo, Mich. A year ago the interest of G. T. Eames was purchased by J. H. Penniman, secretary and treasurer.

C. A. Plunkett, Lewisburg, W. Va., is planning the equipment of an automobile repair shop.

OBITUARY

Philander R. Jennings

Philander R. Jennings, senior member of the firm of Bruce & Cook, the oldest and largest dealers in tinplate, sheets and metals in New York City, died September 21 at his country home, Merrick, L. I., aged 63 years. He had not been well for some months, but his indisposition was not believed to be of a serious character and his death came as a shock to his many friends and business associates. He leaves a widow and two brothers, one of whom was associated with him in business.

Mr. Jennings entered the employ of Bruce & Cook 45 years ago and during his long connection with it served in every capacity from the bottom up, as has every other partner of the firm done since its founding in 1812. He was admitted to the firm in 1885. Prior thereto he was in charge of the tin-plate department of the business. He was a nephew of John C. Cook, who was a partner in the firm from 1855 to 1885. Mr. Jennings was a prime mover in all concerted movements looking to the betterment of the trade and invariably presided at its meetings and dinners. He was a man of distinguished appearance and of forceful, quiet dignity, possessed of traits which made him both liked and respected by all with whom he came in contact. His acquaintance and friendship with the trade extended to metal houses in many other cities. He was treasurer of the arch-deaconry of the Long Island diocese of the Protestant Episcopal Church and a member of the Union League Club of New York, the Hamilton Club of Brooklyn, the Fulton Club of New York and other organizations, as well as a director of the Market and Fulton Bank, New York. The members of the firm of Bruce & Cook are now Frank C. Jennings, who becomes senior partner; A. Gardiner Cooper and August C. Pieper.

WILLIAM NORTON AYERS, Fort Smith, Ark., died September 2, aged almost 90 years. He was born in Warren, Ohio, and from the time of his majority had been identified with the hardware and metal trades. He conducted successful hardware and tinware stores in Waupun, Wis.; Olympia, Washington (Territory), and since 1866 at Fort Smith. In 1887 he retired from the hardware business, and in 1889 bought the controlling interest in the Ketcham Iron Company, which embraced a machine shop, forge shop, boiler shop and iron and brass foundries. He managed the affairs of this company until August, 1900, when he relinquished the management to his sons, John, Walter and William N., Jr. He served on the Fort Smith School Board and the City Council, and was active in civic and educational affairs in all the communities which claimed his citizenship. His wife died in 1900.

WALTER N. BOWLER, Cleveland, Ohio, vice-president and director of the Bowler Foundry Company, and until recently president of the Forest City Paint & Varnish Company, died suddenly September 17, from a stroke of paralysis, aged 65.

The manufacture of Portland cement in Texas, says the United States Geological Survey, is an industry which was barely five years old at the end of 1913. The construction of the plants was begun in 1907, and in 1908 the total production of the State was 500,000 barrels; in 1911 it exceeded 1,500,000 barrels; in 1912 it exceeded 1,750,000 barrels, and in 1913 it amounted to 2,108,737 barrels. The value of the cement produced in Texas in 1913 was $2,663,063, an increase of over $600,000, from $2,062,124 in 1912. Raw materials for the manufacture of cement are abundantly distributed throughout the State. The present operations are confined to four plants, two near Dallas and one each at San Antonio and El Paso.

SAFETY CONGRESS IN CHICAGO

Annual Meeting of the National Council for Industrial Safety, Chicago, October 13, 14 and 15

The third annual meeting and congress of the National Council for Industrial Safety will be held at the Hotel La Salle, Chicago, October 13, 14 and 15. Besides the more or less formal meetings, there will be round table sessions and exhibits of safety devices. The council numbers no less than 2200 members. R. W. Campbell, chairman central safety committee of the Illinois Steel Company, is president, and W. H. Cameron, formerly of the American Steel Foundries, is secretary-treasurer. The programme is as follows:

Tuesday, October 13, 10 a. m.—Business session with reports from officers and local councils, election of directors, etc.

Tuesday, 2 p. m.—Government session: Royal E. Meeker, United States Commissioner of Labor Statistics, chairman.

"How Governmental Agencies May Best Co-Operate with Manufacturers, Transportation Companies and Others," by H. M. Wilson, engineer-in-charge Bureau of Mines, Pittsburgh.

"Safety First in Europe," by Dr. John Price Jackson, commissioner Department of Labor and Industry, Harrisburg, Pa.

"Effective Co-Operation Between Governmental Agencies," by Barney Cohen, assistant chief, Department of Factory Inspection of Illinois, Chicago.

Tuesday, 2 p. m.—Economics session: C. B. Connelly, dean Carnegie Institute of Technology, Pittsburgh, chairman.

"Safety as a Part of the Education of an Engineer," an address by the chairman.

"Effects of Safety on the Community," by Miss Ida M. Tarbell, New York; discussion, J. B. Douglas, manager claim department, United Gas Improvement Company, Philadelphia.

"Efficiency in Safety Work," by Dudley R. Kennedy, special agent, Youngstown Sheet & Tube Company, Youngstown, Ohio; discussion by George T. Fonda, safety engineer, Bethlehem Steel Company, South Bethlehem, Pa.

"Practical Results Obtained in Safety," by H. W. Forster, chief engineer, Independence Inspection Bureau, Philadelphia; discussion by Don D. Lescohier, chief statistician, Department of Labor and Industries, Minneapolis.

Tuesday, 5 p. m.—Motion pictures: "The Lineman," by Victor T. Noonan, Rochester, N. Y.; "Safe and Unsafe Practices on Interurban Electric Railways," presented by the Pacific Electric Railway Company, Los Angeles.

Wednesday, 9.30 a. m.—Round table discussion, L. R. Palmer, Pennsylvania Department of Labor and Industry, chairman; subject, "Methods of Instruction"—(a) for maintenance and use of safeguards; (b) for unsafe practices; (c) for observance of rules.

Wednesday, 2 p. m.—Industrial hygiene session; Dr. George B. Young, health commissioner of Chicago, chairman.

"Relation of Industrial Sanitation to Public Health," address by the chairman.

"The Status of Protection of Workers in the Lead Industry in the United States"—(illustrated by motion pictures), by Dr. F. D. Patterson, director, department of sanitation and accident prevention, Harrison Bros. & Co., Philadelphia; discussion by Dr. Alice Hamilton, Chicago.

"The Physical Examination of Workers," by Dr. J. W. Schereschewsky, United States Public Health Service, Washington, D. C.; discussion by Dr. G. M. Price, New York City; Dr. Theo. B. Sachs and Dr. A. M. Harvey, Chicago.

"Industrial Sanitary Standards," by Dr. G. M. Price, director, Joint Board of Sanitary Control, New York City.

Wednesday, 5 p. m.—Motion pictures: "Safe and Unsafe Practices," J. G. Brill Company, Philadelphia, presented by Dr. F. D. Patterson; "The Assembling of an Automobile," Ford Automobile Company, Detroit.

Thursday, 9.30 a. m.—Round table, L. R. Palmer, Harrisburg, Pa., chairman; subject, "Methods of Educating Workmen in Accident Prevention."

Thursday, 2 p. m.—Transportation and Public Service Session: Martin J. Insull, vice-president, Middle West Utilities Company, Chicago, chairman.

"Safety as a Means of Bettering the Relations Between the Public and Public Service Corporations," an address by the chairman.

"The Safety Problem of the Railroads," by W. B. Spaulding, chairman, central safety committee, St. Louis & San Francisco Railway, St. Louis; discussion by R. H. Newbern, superintendent, Pennsylvania Lines, Philadelphia; M. A. Dow, general safety agent, New York Central Lines, New York City; E. L. Tinker, safety supervisor, El Paso & Southwestern Railway, Houston, Tex.

"Safety Problem in the Municipality," by William P. Eno, Washington, D. C.; discussion by John Doheny, investigator of accidents, Pennsylvania Public Service Commission, Harrisburg, Pa.; I. H. Wise, secretary, Syracuse Chamber of Commerce, Syracuse, N. Y.; William A. Searle, secretary, Rome Chamber of Commerce, Rome, N. Y.

Thursday, 3.30 p. m.—Manufacturers' session; M. W. Mix, president, Dodge Mfg. Company, Mishawaka, Ind., chairman.

"Safety as an Asset to Manufacturers," an address by the chairman.

"Co-Operation in Safety Work by Manufacturers and Trade Associations," by Ferd. C. Schwedtman, chairman, committee of accident prevention and workmen's compensation, National Association of Manufacturers, Springfield, Ill.; discussion by M. W. Alexander, General Electric Company, West Lynn, Mass.; J. C. Parker, mechanical and electrical engineer, Rochester Railway & Light Company, Rochester, N. Y.

"Effective Co-Operation Between Employer and Employee," by J. A. Robertson, manager, camera works, Eastman Kodak Company, Rochester, N. Y.; discussion by L. B. Robertson, general attorney, Ford Motor Company, Detroit; L. B. Burnett, assistant to president, Carnegie Steel Company, Pittsburgh.

"Mechanical Progress and Safety," by Dr. Lucian W. Chaney, United States Department of Labor, Washington, D. C.

Semi-Centennial of Illinois Iron & Bolt Company

The Illinois Iron & Bolt Company, Carpentersville, Ill., on September 17 celebrated its semi-centennial with an all-day celebration in a local park. An extensive programme, beginning early in the morning and running to a late hour in the evening, had been prepared which scheduled competitive games and other exercises and addresses by President J. F. Fierke and Vice-President E. F. Cleveland. The employees of the company and their families only were eligible for the contests. It is estimated that 3000 persons were in attendance. The town and park were elaborately decorated with flags and bunting and in the evening the shops were illuminated. An award of $10 in gold was made to the head of the largest family on the grounds, $25 to the employee longest in the service of the company, $15 to the second and $10 to the third. Souvenirs of the celebration were gold-plated medals impressed with the company's trademark, encircled by a belt bearing the name of the corporation and the dates 1864 and 1914. A poem dwelling on the growth of the plant, written by Ella D. Obland, Sioux City, Iowa, was read by Howard C. McNeil, Elgin, Ill., treasurer of the company.

The production of natural gas in the United States in 1913 surpassed that of any previous year. It is estimated by B. Hill, of the United States Geological Survey, at 581,898,239,000 cu. ft., valued at $87,846,677, as compared with a production of 562,203,452,000 cu. ft., valued at $84,563,957 in 1912. About 32 per cent. was utilized for domestic purposes and 68 per cent. for industrial purposes. The industrial consumption includes gas used for both manufacturing and producing power. The extraction of gasoline from natural gas, or casing-head gas, from oil wells has become an industry of some importance. Returns received from producers of gasoline of this character indicate that the production in 1913 amounted to 24,060,817 gal., valued at $2,458,443, as compared with a production of 12,081,179 gal., valued at $1,157,476, in 1912.

The Logemann Brothers Company, Milwaukee, Wis., manufacturer of baling presses, cabbaging machines, hydraulic presses and pumps, has removed to its new plant, Thirty-second and Burleigh streets. It has been specially built for the construction of the company's products and occupies two and one-half acres. The company will add further to its extensive line of baling machines.

American Locomotive Company's Report

The American Locomotive Company has issued its thirteenth annual report, which covers the operations of the fiscal year ended June 30, 1914. This report shows a heavy decrease in earnings and profits. The gross earnings fell from $54,868,174.88 in the previous year to $29,987,438.25. The amount carried to profit and loss was only $326,127.45, against $3,835,305.27 in the previous year. The condensed income account, which includes not only the company's plants in this country but also the Montreal Locomotive Works, Ltd., is as follows:

	1913-14	1912-13
Gross earnings	$29,987,438.25	$54,868,174.88
Manufacturing, maintenance and administrative expenses and depreciation	27,425,186.65	48,041,691.25
Net earnings	$2,562,251.60	$6,826,483.63
Interest, etc., on bonds of constituent companies, coupon notes, etc.	486,124.15	641,178.36
Profit	$2,076,127.45	$6,185,305.27
Dividends on preferred stock	1,750,000.00	1,750,000.00
Surplus	$326,127.45	$4,435,305.27
Reserve for additions and betterments	.....	600,000.00
Net credit to profit and loss	$326,127.45	$3,835,305.27

The combined general balance sheet as of June 30, 1914, is as follows:

Assets

Cost of property	$52,609,059.72
Securities owned	826,072.17
Band deposits subject to check	3,434,996.58
Time deposits	3,950,000.00
New York City stock certificates	510,470.60
City of Newark revenue bonds	500,000.00
New York City bonds	16,000.00
Accounts collectible	5,114,530.96
Bills receivable	1,857,415.96
Accrued interest	66,532.60
Material and supplies	2,707,505.20
Contract work in course of construction	974,851.39
Locomotives, snow plows, etc., in stock	280,453.76
Sundry deferred charges	113,258.52
Notes discounted (per contra)	464,093.68
Total	$73,425,241.14

Liabilities

Preferred stock	$25,000,000.00
Common stock	25,000,000.00
Bonded debt of constituent companies	2,255,000.00
Coupon notes outstanding	5,474,000.00
Accounts payable	1,022,135.73
Income tax withheld at source	937.54
Accrued interest	150,638.24
Unclaimed interest	705.00
Dividends payable July 21	437,500.00
Indorsements (per contra)	464,093.68
Depreciation reserve	694,856.36
Reserve for loss in liquidation of automobile business	1,062,645.02
Reserve for additions and betterments	327,071.47
Profit and loss	11,535,658.10
Total	$73,425,241.14

From the accompanying remarks of President W. H. Marshall the following extracts are taken:

The total of new locomotive orders received in the year was equivalent to only about 25 per cent. of the company's capacity. At the beginning of the year there were unfilled locomotive orders on the books of $17,156,388, as compared with $4,162,356 at the close of the year. Such orders as were secured during the year were taken at a very small margin of profit, in some cases at practically cost, in an effort to keep the plants running.

There has been made with gratifying results a constant effort to reduce expenses in every direction to meet the large falling off in the business. As a part of such reductions drastic action has been taken in respect to the salaried forces.

Attention is called to the very strong cash position of the company. The large increase in cash resources represents, for the most part, working capital which is ordinarily engaged in productive transactions of the business. In addition there has been released cash of about $1,250,000 from liquidation of assets of the automobile business. As it became apparent that the accumulation of cash was far in excess of the immediate needs of the business, purchase was made of municipal securities, and substantial sums were placed on time deposits, all of short term maturity. The company sought also to take advantage of the cash on hand by the redemption of $2,000,000 notes which fall due October 1, 1914. It was not found possible, however, to obtain all of this issue at reasonable prices, but $742,000 was purchased. There was also purchased $584,000 notes of series, J, K and L.

All the assets of the automobile department have been liquidated into cash, except the factory, land and buildings at Providence, R. I., the Long Island City service building, a stock of repair parts and a small amount of machine-tool equipment.

At a special meeting of directors of the American Locomotive Company, September 17, S. L. Schoonmaker and A. W. Mellon were elected directors, and Pliny Fiske, of Harvey, Fiske & Co., and J. McNaughton, resigned. Mr. Schoonmaker was also made chairman of the board of directors. Mr. Fiske gave as his reason for resigning from the board the fact that he has not sufficient time to attend properly to his many directorates. Mr. McNaughton remains vice-president of the company. Mr. Schoonmaker was long identified with the coke industry and has exceptional business ability. Mr. Mellon is president of the Mellon National Bank of Pittsburgh, and has had a great deal of experience in industrial fields. He is identified with numerous Pittsburgh enterprises as well as others among the largest in the country.

Meeting of National Society for Promotion of Industrial Education

The city of Richmond, Va., has requested the National Society for the Promotion of Industrial Education to make an industrial and educational survey for the purpose of obtaining information concerning the principal occupations, especially those in which young people are employed, in order to formulate plans for improving the opportunities for training and preparation for the vocations. The survey was begun May 1 and will be finished October 15. The special committee of the society in charge includes Dr. Leonard P. Ayres, Russell Sage Foundation; L. W. Hatch, Department of Labor, Albany, N. Y.; Charles H. Verrill, Bureau of Labor Statistics, Washington, D. C.; J. A. C. Chandler, superintendent of schools, Richmond; Charles H. Winslow, Bureau of Labor Statistics, Washington, D. C.; Charles R. Richards, director Cooper Union, New York City, and C. A. Prosser, secretary of the society.

A synopsis of the findings will be printed in tentative form and reported to the National Society for the Promotion of Industrial Education at a convention in Richmond December 9 to 12.

The Standard Welding Company, Cleveland, Ohio, is building its third large addition of the year. The newest structure is of structural steel, with corrugated asbestos, metal reinforced roofing and siding. The dimensions are 60 x 240 ft. and 30 ft. high. The new building is to be devoted entirely to the storage of seamless steel rims and will accommodate approximately 100,000 rims of various types. The construction of the new building is necessitated by the growing demands of bicycle, motorcycle and automobile manufacturers for Stanweld rims.

The Newark Foundrymen's Association, Newark, N. J., at its first meeting of the season, to be held October 7, will be addressed by Leonard Peckitt, Empire Steel & Iron Company, on "Blast Furnace Practice and Ores." The meeting will be held at the Washington restaurant. Persons outside of the association who desire to hear Mr. Peckitt's address should communicate with the president, H. P. Macdonald, Snead & Co., Jersey City, or the secretary, J. Smylie Kinne, Riverside Steel Casting Company, Newark.

The New Jersey Wire Cloth Company has removed its New York office and store from 219 Fulton street to 210 Fulton street, where it occupies the entire building and has larger and better facilities. A large stock of the company's regular products, such as wire cloth netting, wire lath, etc., will be carried.

Progress in South American Trade Problems

Activity of National Foreign Trade Council—Steps That Need Most to Be Taken to Meet the Present Crisis—Germany's Crippled Steel Trade

Secretary Redfield on Right Methods of Winning South American Trade

WASHINGTON, D. C., September 22, 1914.—Secretary Redfield, of the Department of Commerce, has issued a warning against the danger of ill-considered attempts to extend our markets in South America. This has taken the form of a report to the Senate on Senator Weeks's resolution asking the department for a statement concerning the plan to use naval vessels to exploit American products in South America. Mr. Redfield is opposed to this project and suggests instead that efforts be made to assist South America "in her urgent financial needs." In his report Secretary Redfield says:

> The Department is keenly interested in any legitimate plan to promote our foreign trade, but financial and trade conditions in Latin America are such at this moment that any development of our commerce must proceed under the most carefully developed plans if actual disaster is not to result.
>
> There exists no lack of information with respect to conditions in those markets, and it is the judgment of this Department that the proposed methods of sending ships now in the military or naval service of the United States with samples would be productive of comparatively little value at this time. The display of individual and corporate products, it is believed, should not be made under the auspices of the Federal government, but by commercial and other firms.
>
> It would rather seem that measures should be taken if practicable in our country to assist South America in her urgent financial needs. If and when these things are done, and hardly before then, it will be time to look for the placing of considerable orders for American products.

The report refers to the work the Department of Commerce has already done, including the assignment of commercial attaches to Rio Janeiro, Buenos Aires, Santiago and Lima, the sending of commercial agents to travel through different parts of the country and the expected increase of the force so that the department will soon have 10 or 12 men in South America.

In a speech before the annual convention of the American Association of Public Accountants, Secretary Redfield pointed out the difficulties of securing South American trade for the United States. He said:

> These countries are more interested in placing their own products than they are in buying products from the United States, for which they have not money to pay. Latin America needs more now than commercial travelers. It needs credit and the machine for handling this credit. They haven't the machinery of commerce developed yet. The first thing in Latin America is the spirit of service. We have got to serve in order to get the commerce. The French, the British and the Germans have served Latin America. They gave money, brains and influence. That's what the United States will have to do before it can get the Latin American trade.

LATER DATA ON SOUTH AMERICAN COMMERCE

Later figures compiled from cabled reports to the Pan-American Union show an even greater total of Latin-American commerce for 1913 than was represented in the preliminary reports. According to these figures, the 20 Latin-American countries of Central and South America had in 1913 a total foreign commerce of $2,870,188,575. The imports were valued at $1,304,261,763 and the exports at $1,565,916,812. These leave Latin America with a trade balance in its favor of $261,655,049.

In this commerce the United States ranks second in the matter of Latin-American imports. The United States sold to these nations in 1913 a total of $317,323,294, while Great Britain furnished products valued at $322,036,347. The third nation was Germany—practically $100,000,000 behind these competitors—with $216,010,418. The imports from other countries follow: France, $103,220,223; Italy, $55,494,413; Belgium, $48,747,164; Austria-Hungary, $9,026,478; Netherland, $8,293,859; Switzerland, $6,189,050; all other countries, $217,290,517.

Although the United States ranks second, the possibilities for building up its trade are shown by the fact that the total of Latin-American imports, aside from those coming from the United States, amount nearly to $1,000,000,000, or exactly $986,938,469. The exports of Latin America, which have now lost most of their European markets, amounted in 1913 approximately to $1,566,000,000. The United States was the greatest purchaser, taking products valued at $504,378,212. The other countries ranged as follows: Great Britain, $316,419,914; Germany, $192,394,702; France, $120,907,415; Belgium, $62,557,566; Netherlands, $43,277,631; Italy, $27,964,001; Austria-Hungary, $23,294,991; all other countries, $247,722,380.

"These statistics," declares a report of the Pan-American Union, "are obvious evidence of the present United States responsibility and opportunity in Latin-American commerce and of the immediate necessity of a readjustment of international trade conditions for the benefit not only of the United States but of the Latin-American countries." W. L. C.

Banking and Credit in South America

WASHINGTON, D. C., September 22, 1914.—The difficulties of financing the South American trade which the United States expects to gain as the result of the European war are emphasized in a special report (Special Agents' Series No. 90) that has just been issued by the Department of Commerce from Edward N. Hurley, who made a tour of South America last spring. Mr. Hurley is an Illinois banker and was a candidate for the secretaryship of the Treasury in President Wilson's cabinet. In connection with the report he gives lists of the principal foreign and native banks in South American countries, a description of their monetary systems, a summary of their foreign trade, an outline of their banking laws, and a discussion of banking practice, credit information service and exchange methods. Mr. Hurley's most striking declaration is that the foreign branch banks provided for by the new Federal Reserve act will not meet the requirements of our South American commerce. He made a particular study of the situation in Argentina, Brazil, Chile and Peru and the report discusses the banking and financial phases with much detail. The following quotation embodies Mr. Hurley's main conclusion:

> The compulsory use of European materials in many South American enterprises financed by Europe is steadily restricting the potential market for American manufactures. American prestige suffers by comparison with the European nations represented in South America by powerful banks. American salesmen and trading houses lack the support given by foreign banks to their national trade seekers. American banks are imperatively needed in South America as a dependable resource in the campaign for greater trade.
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> American manufacturers and exporters possess no national facilities for financing export trade that at all approximate the resources of their rivals. If a manufacturer or exporter asks a bank in New York to discount a draft on a South American customer, the bank extends or denies the accommodation according to the standing of the manufacturer or exporter. The bank has little or no information of its own regarding the customer in South America. It must obtain the information through a European bank in South America, or that institution's agency in New York, or from one of the powerful native banks. A well-known American mercantile agency is steadily extending its business in South America, but mercantile information and banking information are somewhat different.

Mr. Hurley declares that the provisions of the Federal reserve law for the establishment of foreign branches of national banks do not meet the requirements of the South American situation because of the restriction of the kind of banking that may be done. He declares that to be of real service the banks of South America must maintain an intimate connection with loans to governments and cities as well as industrial investments which, he says, would not come under the operation of the Federal reserve act. "The conclusion, therefore, seems irresistible that the banking facilities demanded for the South American trade would have to be provided by some institutions outside the Federal reserve system. Consequently, the large State banks and trust companies receiving their charters from some State of the United States are the institutions to which South American trade must look for assistance in order that American business men should get the same facilities as Germans and Englishmen receive from their own banks established for the encouragement of foreign trade." W. L. C.

Foreign Trade Council Plans for Convention

The National Foreign Trade Council held its first meeting at the Biltmore, New York, September 16, presided over by James A. Farrell, chairman of the council. Those present included also the following:

E. A. S. Clarke, president Lackawanna Steel Company; Samuel D. Capen; Walter L. Clark, Niles-Bement-Pond Company; Col. Samuel Pomeroy Colt, president United States Rubber Company; P. A. S. Franklin, International Mercantile Marine Company; Fairfax Harrison, president Southern Railway; H. C. Harget, Chicago; Lloyd C. Griscom; Maurice Coster; E. N. Hurley, president Hurley Machine Company, Chicago; Charles E. Jennings; Alba B. Johnson, president Baldwin Locomotive Works; D. W. Kempner, Galveston, Tex.; Cyrus H. McCormick, president International Harvester Company; M. A. Oudin, manager of foreign business, General Electric Company; Barton Myers, Norfolk, Va.; Charles H. Muchnic, manager foreign department, American Locomotive Company; William Pigott, Seattle; John D. Ryan, president Amalgamated Copper Company; W. L. Saunders, president Ingersoll-Rand Drill Company; Charles A. Schieren; Willard D. Straight; E. P. Thomas, president United States Steel Products Company; F. A. Vanderlip, president National City Bank, and R. H. Patchin, secretary.

The discussions took a wide range and a resolution was passed providing for the appointment of committees to make recommendations for the development of foreign trade. Among these will be committees on merchant marine, American banking facilities abroad, and commercial education for foreign trade. There will also be a committee to deal with the problem of combined effort by small manufacturers to get foreign trade, without acting in violation of the Sherman act. A committee will also act with a committee of the Chamber of Commerce of the United States of America. It was decided to call the next National Foreign Trade Convention to meet in Washington in January or February, 1915.

National Committee on Latin-American Trade

Secretary Redfield has made some additions in the past week to the committee already organized in New York to deal with Latin-American trade problems. The original committee consists of James A. Farrell, E. P. Thomas, Willard Straight, J. P. Grace, William E. Peck, William Schall, Daniel Warren, J. H. Waddell and William Bayne. The following are now invited to join the above committee: William A. Gaston, president National Shawmut Bank, Boston; Harry A. Wheeler, vice-president Union Trust Company, Chicago; Alba B. Johnson, Baldwin Locomotive Works, Philadelphia; Robert Dollar, San Francisco; John Barrett, director Pan-American Union, Washington; W. D. Simmons, Simmons Hardware Company, St. Louis; Fairfax Harrison, Washington; Lewis W. Parker, president Parker Cotton Mills Company, Greenville, S. C.; W. B. Campbell, president Perkins-Campbell Company, Cincinnati; Dr. Clarence J. Owens, managing director Southern Commercial Congress, Washington. The enlarged committee will consult as may be required with the consular and diplomatic representatives of Latin America, and will be assisted by the Departments of State and of Commerce.

Acknowledgments from a British Buyer

Percy G. Donald, of Rownson, Drew & Clydesdale, Ltd., 225 Upper Thames street, London, who has been in New York City for the past two weeks representing a syndicate of wholesale builders' hardware merchants of England, in negotiating for American products, has written *The Iron Age* as follows:

"Before leaving for England may I express my great appreciation of the courtesy extended to me, especially by the trade press. I will be at all times very happy to give any information to manufacturers here regarding trade conditions and the possibility of sales in their particular lines, if you would care to address me. I may say that we are particularly interested in the following goods which may have many manufacturers here, but none of whom have I had the pleasure of meeting:

Tube screwing and cutting machinery.
Sash cords, threads and cotton.
Window glass.
Lead pipes and sheets.
Expanded metal.
Screws and fly nuts as used in tennis presses.
Small timber frames for use as tennis presses.
Light open-seam tubes.

"Apart from the above, which my firm is interested in to the extent of placing needed orders, there should be good openings in the following goods, which apparently the States are particularly well placed to turn out:

Enameled ware.
Electric fittings and lamps.
Wire netting.
Bolts and nuts.
Barb wire.

"For goods in my firm's particular line, which may be competitive, we might be prepared to consider an agency; where they are not, I shall be pleased to advise as to the most suitable firms from either a buying or agency point of view."

How to Sell to South America and Make Trade Permanent

WASHINGTON, D. C., September 22, 1914.—Because of the great demand for specific information concerning the methods of securing South American trade, the Pan-American Union has issued a special statement as to the trade conditions in South America affected by the European war and methods for extending American sales there. The report emphasizes particularly the necessity for "personal contact" in attempting to secure this commerce. It points out that this is the fundamental difference between methods of dealing with Europe and with Latin-America. With reference to this the report says:

Circulars, circular letters, catalogues, etc., addressed to prospective buyers or commission houses, in 99 cases out of 100, accomplish nothing in Latin America. In other words, they are worth much less than they are in the United States in our domestic trade, and they are not worth much here. To reach the Latin American trade you must send a salesman with samples of goods—that is the only way. Occasionally voluntary orders may come and have come from Latin America to the United States, but these can not be depended upon.

Concerning the kind of salesmen necessary to reach this trade, it is emphasized that one of the chief qualifications is the knowledge of the language of the country—Spanish in all of them except Brazil where Portuguese is the official language. But even more import is "salesmanship." Of this the report says:

The first requisite in a Latin American salesman, more important even than the ability to speak the language, is salesmanship. There is no material difference in salesmanship in any part of the world. A man who can sell goods in Texas can ordinarily sell them in London or Buenos Aires. The Latin-American buyer usually demands a little more personal consideration. He does not like the brusque, abrupt style of salesmen, but good salesmen from the United States find the same kind of buyers here, and know that they must adapt themselves to the conditions. They do adapt themselves to conditions here and they will there.

SOUTH AMERICAN TARIFFS NOT AN OBSTACLE

A large number of the inquiries received by the Pan-American Union have dealt with the tariff rates of South America. The tariffs are largely for revenue without reference to the protection of local industries. The chief exceptions are in Brazil, which has a few protected industries, mostly low grade textiles. Argentina has a protective duty on shoes. As a general rule, the statement declares, South American tariffs are a negligible feature, because the buyer there does not want the prices quoted "duty paid." He prefers to arrange the custom house details himself. With reference to "selling terms" this statement is made:

> European exporters have been accustomed to giving longer credits than we usually give, but this matter is not so serious as some have made it appear. The credits in reality are secured by the banks through acceptances. The financial methods are the same in Latin America as in Europe. The American manufacturer selling to Latin America has therefore been at a disadvantage, since heretofore we have had no representation among Latin American banks. This condition, it is hoped, will be changed soon. At present excellent reports on credit can be secured through Latin American banks and their correspondents in New York.

The Pan-American Union emphasizes the importance of making our conquest at these markets a permanent one, instead of a superficial attempt to secure a trade temporarily embarrassed by European complications:

> It must be remembered that the European war at the bottom will not benefit any country. Its result is to disturb conditions everywhere. We in the United States are hurt and so are the people of Latin America, but some here and some there are hurt more than others. In a way the war offers an opportunity to secure entrance into a field where we have heretofore but little operated. But should our American manufacturers look at the opportunity merely as one of securing a derelict trade, in other words, as something temporary, it is believed that they will be seriously disappointed. Generally speaking, there will be no derelict trade so far as Latin American imports are concerned. Of course, any particular one of the warring countries, whose commercial navy is entirely bottled up and whose ports are blockaded, will be shut off from the trade. This goes without saying. But the European countries which are able to keep the seas will not drop their Latin American trade. In fact, they will bend every energy and adopt extraordinary means of continuing this trade. France and England have already considered work along these lines. Trade is the life blood of a nation and more important in time of war than in time of peace. So we should remember that there will be nothing derelict as to the countries able to keep the seas.
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> Furthermore, the American exporters have heretofore been compelled for the most part to use foreign vessels in shipping their goods to Latin America. This condition remains and will remain, unless by the operation of laws now discussed in Congress we may secure an ocean-going commercial fleet of our own. Unless this latter hope is realized, the position is this, that when we ship our goods to Latin America, so can the country under whose flag our goods go, be this country England, France, or one of the neutral countries—Italy, Spain, etc.

According to its officials, the Pan-American Union has been swamped by the enormous number of inquiries made by manufacturers throughout the United States concerning South American opportunities. Every effort is being made, however, to answer inquiries as promptly as possible. W. L. C.

United States Coal for South America

WASHINGTON, September 14, 1914.—With a view to aiding the coal operators of the United States to expand their markets at a time when the exporters of other coal-producing nations are inactive, the Bureau of Mines has issued a bulletin describing the various coals of the country which are best available for foreign shipment. It is printed in Spanish, Portuguese and English, and will be given special distribution among the large coal users and importers of South and Central America. That this important field is as yet slightly developed as a market for United States coals is shown by the statistics of coal exports. Of 16,083,101 tons of coal exported in 1913, but 450,000 tons went to South America. Canada was the best customer, taking 11,500,000 tons. The bulletin lists as available for this promising export trade seven groups of coal fields. These are the Pocahontas and New River coals of West Virginia, with Norfolk and Newport News as shipping ports; the Maryland and eastern Pennsylvania coals, to go through Baltimore or Philadelphia; the Virginia, Kentucky and Tennessee coals, through Hampton Roads or Charleston; the Alabama coals, through Mobile or New Orleans; the western Pennsylvania coals, through New Orleans; the Illinois and Indiana coals, through New Orleans; and the Washington coals, through Seattle. The bulletin gives in detail the general characteristics of the various coals, and points out which are the best adapted to railroad use, manufacturing, gas-making or coke-making. Average analyses are given, and the heating-values are expressed in British thermal units and in calories.

Various Foreign Trade Developments

At Chicago the organization of a $2,500,000 export company under the auspices of the Association of Commerce is going forward. The company will deal entirely with South American business, the territory being divided into three parts with a branch in each. The Chicago Association of Commerce has recently referred a number of inquiries from foreign companies to manufacturers in the Chicago district.

The Foreign Trade Bureau of the Philadelphia Commercial Museums received an inquiry from Spain last week for several hundred thousand dollars' worth of ordnance and rifle making machinery. The Spanish Government is also inquiring for dredging machines, concrete mixers, conveying machines and excavators, locomotives and stone crushers, for the erection of what are referred to as "important public works." The inquiry for armament manufacturing machinery for the Spanish Government was made by the Sociedad General de Representaciones, one of the largest firms in Spain.

The Indianapolis Chamber of Commerce is planning a foreign trade bureau to assist local manufacturers in obtaining South American business. Among the companies interested in South American trade are the Lyons Atlas Company, automobiles and Diesel engines; Empire Automobile Company; Nordyke & Marmon Company, milling machinery and automobiles; Enterprise Iron Works, iron and wire fencing; Rockwood Mfg. Company, pulleys; W. D. Allison Company, physicians' furniture; American Can Company; the Waverley Company, automobiles; Dean Bros. Steam Pump Works; Parry Mfg. Company, automobiles; Sinker & Davis, engines and boilers; Wheeler & Schebler, gasoline carbureters; Link Belt Company; National Malleable Castings Company; Diamond Chain Works; E. C. Atkins & Co., saws; Chandler & Taylor, engines and boilers, and the F. W. Spacke Machine Works.

The Standard Roller Bearing Company, Philadelphia, as a result of the shutting off of imports of ball bearings since the outbreak of the European war, has taken on several hundred men and by the end of the month will have its plant running on a normal basis again as regards the number of employees, and possibly operating night and day.

The United States Steel Corporation has reported to the Department of Commerce the sailing under the American flag of its steamers Crofton Hall and Bantu from New York, the former for Chile and Peru and the latter for Uruguay and Argentina, with a total of 18,000 tons of steel and other products. Seven other steamers of the Steel Corporation will sail in the near future, all insured by the Government war risk bureau.

The U. S. Metal & Mfg. Company, 165 Broadway, New York, has been appointed resident purchasing agent in America of the following companies: Underground Electric Railways Company of London, Ltd.; London General Omnibus Company, Ltd.; Metropolitan District Railway Company; London Electric Railway Company; Central London Railway Company; City & South London Railway Company.

English Analysis of German Machinery Exports

In emphasizing the possibilities for British manufacturing engineers to secure more of the world's business owing to the present check on German exportation, the London Times Engineering Supplement makes an analysis of which parts are of interest to machinery manufacturers of this country.

In explanation of Germany's remarkable advance in industry in recent years, it is urged that the business expansion is due "to the superior technical training of what may be called the non-commissioned officers of its industrial army—the foremen, the leading draftsmen, the sub-managers, and the managers of its works—and to the scientific organization of its business generally. . . If we fail [in taking advantage of the present opportunity] we may enjoy a temporary boom, but we shall be beaten later by Germany, if not sooner by our own friends across the Atlantic."

The total value of the international market for machinery in the year 1912 amounted to about $550,000,000, made up of $320,000,000 for the continent of Europe, $82,500,000 for the British Dominions Overseas and $145,000,000 for the rest of the world; that is to say, the nations of the world bought from one another in that year machinery to the value named. Of that total value the United Kingdom contributed 29.3 per cent.; the United States about 28.7 per cent., and Germany about 25.8 per cent. The figures are interesting as indicating how large a proportion of the world's trade in this particular line is held by the three chief competitors, how closely they have drawn together in the great race, and what Germany may now lose by the present war.

Continuing, the Times Engineering Supplement says: "It is no satisfaction to find that the United States, where costly labor has led to the highest developments in machine tools, is also beaten by Germany in regard to the values of that class of machinery sent abroad annually. The German expansion has been remarkable; the value was only $11,600,000 for the period 1901-04, and the increase has thus been no less than $60,800,000, [or to $72,400,000 for 1909-1912], equivalent to 520 per cent."

War Effect on German and Belgian Steel Works

The London Ironmonger's second installment of abstracts from German newspapers contains the following items relating to the condition of the steel trade in some of the districts affected by the war:

In the Rhenish-Westphalian Steel Industry, after the completion of mobilization in the middle of the month a certain industrial revival began to show itself. Upon the urgent representations of the works, the authorities set aside rolling stock for the conveyance of raw materials and the carriage of manufactured goods, and part of the mills resumed work so far as labor conditions permitted. Prices of all descriptions of iron materials were rising; for new business an average advance of 20 shillings per ton was required, and almost all sales were for cash only.

On August 21 one of the leading Upper Silesian steel works made the following statement with regard to the effects of the war upon the local industry: Mining is being carried on to the extent of the available labor. The mineral produced, in so far as it cannot be used at works, goes into stock owing to the interruption of freight traffic. Recently, however, a few consignments have been forwarded by special permission of the military authorities. Very little work is being done, and the output of the blast furnaces is much reduced. The stock of raw materials in Upper Silesia is still considerable.

COCKERILL WORKS UNDER GERMAN CONTROL

A special correspondent of the Handelsblad, of Amsterdam, who had visited Liège, reported on August 28 that none of the large steel works around the city have suffered any material damage. He specially mentions the Vielle Montagne, the Ougrée-Marihaya, and the Cockerill works as having escaped all injury. With one exception, the pumping plant in the coal mines is working regularly. The large chimney of the cement works at Lixhe was blown up, because the Germans suspected that it was used for signaling to the forts during the siege. The Cockerill works at Seraing, near Liège, were seized by the German military commander, who issued the following proclamation: "From this day I assume the management of the Cockerill works. The employees will remain in their positions. The workmen are instructed to obey my commands strictly. Their wages are guaranteed to them. Owing to the increase in the cost of living, the Prussian Ministry of War will concede to them an increase in wages of 50 per cent. during the war. Anyone who does his work exactly, and whose behavior leaves nothing to be desired, will be well treated. All persons who cause trouble, commit sabotage, or intentionally damage manufactures, will be court-martialed and judged with the utmost rigor. Work is to be resumed as far as possible in all departments."

The Rombach Steel Works claim to be the only concern in their district which has been able to continue working, five blast furnaces at Rombach and at Maizières, near Metz, being maintained at work and the water supply being sufficient for the production of the works' own iron mines. The works are executing orders for specialties which are required by the forts of Metz. The other steel and rolling mills in the district are momentarily idle. There is one month's supply of fuel. It is reported that generally speaking the syndicates in the steel industry are taking up an "energetic attitude" towards home buyers, being forced thereto by the absence of remittances from abroad.

Canadian Notes

The Grand Trunk and Grand Trunk Pacific railroads have issued orders to their purchasing agents to buy no more supplies from Germany if they can be had from Canada or Great Britain. The Germans have been supplying large quantities of tool steel, locomotive tires, carwheels and tubes for locomotive boilers.

The Canadian Locomotive Company, Kingston, Ont., reports that its profits were $43,000 less in 1914 than in 1913. When the additions to the plant now under construction shall have been completed the output will be from 15 to 20 locomotives a month.

A commission comprising Thomas Cantley, general manager of the Nova Scotia Steel & Coal Company, Colonel Bertram of Montreal, George W. Watts, Lieutenant-Colonel Lafergie and A. G. Carnegie, Toronto, has been appointed to inquire into the feasibility of the manufacture of shells for Canadian and British field artillery guns in Canada. The Dominion Government has set aside $2,000,000 to be used in this work.

As an outcome of the European war, an addition may be made to the plant of the Dominion Steel Company at Sydney, N. S.

Under the terms of the war measures act adopted at the recent session of Parliament, an order-in-council has passed respecting patents in Canada by alien enemies. Any person who wishes to obtain a right to manufacture a process covered by patent must make special application to the Minister of Agriculture, who will grant it only when regarded to be in the public interest. There is to be no general cancellation. The minister is given absolute discretion as to the terms for which applications are to be granted. Applications for patents made by alien enemies which were pending when the war broke out are held in abeyance.

"The Commercial Relations of the United States," a volume of 272 pages, just issued by the Bureau of Foreign and Domestic Commerce, Department of Commerce, contains revised figures showing in detail for the year 1912, compared with the previous year, the articles entering into the trade of each country and the commercial transactions with the United States. This volume should prove valuable to those interested in the foreign trade of the United States and foreign countries. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 40c. each.

Pittsburgh and Nearby Districts

The mechanical department of the Engineers' Society of Western Pennsylvania will meet October 6 in its rooms in the Oliver Building, Pittsburgh. J. G. Berg, chief engineer of the Dravo-Doyle Company, is scheduled to read a paper on "Steam Turbine Mill Drive."

The Aetna Foundry & Machine Company, Warren, Ohio, has built a large plate shear for the United States navy yard at Charlestown, S. C., which has several new features in its construction. It has brought out a new design of sheet doubler, of which it is building three to be installed in the mills of the Follansbee Brothers Company, Follansbee, W. Va.

The Bessemer steel plant, the 8 and 10 in. skelp mills, the large plate mill, the 14 and 16 in. bar mills and the hoop mill of the Republic Iron & Steel Company, Youngstown, Ohio, are closed this week for lack of orders. The active departments at present are the open-hearth steel plant, the pipe mills, the 7, 8 and 10 in. continuous mills and the 12 and 20 in. bar mills.

The Meehan Boiler & Construction Company, Lowellville, Ohio, has secured a large order for steel stacks and other plate work for the new open-hearth plant of the Youngstown Iron & Steel Company, Youngstown, Ohio.

The National Roll & Foundry Company, Avonmore, Pa., has received an order for three hot-sheet mills and two stands of cold mills for the sheet-mill plant of the Follansbee Brothers Company, Follansbee, W. Va., and also two stands of 20-in. mills for the Gulf States Steel Company, Birmingham, Ala. It recently shipped a Belgian 14-in. roughing mill and a 9-in. finishing mill to the United Steel Company, Canton, Ohio.

At a meeting of directors of the Youngstown Sheet & Tube Company, held in Youngstown, Ohio, last week, officers were re-elected as follows: James A. Campbell, president; H. G. Dalton, Cleveland, first vice-president; C. S. Robinson, second vice-president; W. E. Manning, secretary; Richard Garlick, treasurer, and John Brant, auditor.

The Jones & Laughlin Steel Company, Pittsburgh, is adding eight 84-in. duplex tinning stacks to its tinplate plant at Aliquippa, Pa., making a total of 52 stacks of this size and type. The 32 hot tin mills in this plant are operating to full capacity.

What he calls a hardening copper, an alloy of over 80 per cent. copper and the remainder mostly tin, has been put on the market by S. R. Dawson, 42 Broadway, New York City, for sale chiefly in ingot form of 3 to 20 lb. weight. The material is ascribed a tensile strength of 34,000 lb. per square inch, and fractures at this point without elongation. It is given a compression strength of 81,460 lb. at the elastic limit and 200,000 lb. per square inch at destruction. The hardness number is 143 on the Brinnell scale.

The Chamber of Commerce of Providence, R. I., has enlisted the aid of the chambers of commerce and boards of trade throughout New England in the effort to secure a change in the patent laws of the United States that will prevent a repetition of the present situation among the manufacturers, due to the shortage of dyestuffs. Some of the leading organizations in New England have answered with assurances that Congressmen and Senators will be urged to act at once on the questiton.

The blast furnace of the Leesport Furnace Company, Leesport, Pa., was blown out September 9. A considerable stock of pig iron is on hand.

Warwick furnace A of the Eastern Steel Company, at Pottstown, Pa., was blown out September 4 and repairs are now being made.

PERSONAL

R. A. Bull, who was elected president of the American Foundrymen's Association at its convention in Chicago, September 11, has had a foundry experience of fourteen years, succeeding five years' service as inspector for Robert W. Hunt & Co. He was chief inspector and foreman of pipe runs of the U. S. Cast Iron Pipe & Foundry Company, at Bessemer, Ala. He was later chief inspector of Shickle Harrison & Howard Iron Company, East St. Louis, Ill., and then general foreman and later assistant to the vice-president and general manager of the Leighton & Howard Steel Company. He has also been identified with the American Steel Foundries, as district inspector, chief clerk to the second vice-president, chief clerk to the general sales agent, St. Louis, and manager order department in New York City. He then became assistant works manager, general superintendent and manager of production of the Commonwealth Steel Company, Granite City, Ill. He was born at New Albany, Ind., in 1874, and was graduated from Butler College and St. Louis University. He is a past president of the St. Louis Foundrymen's Club and member of the executive board of the St. Louis section of the American Institute of Mining Engineers. He is a member of the Iron & Steel Institute of England, the American Society for Testing Materials and the American Institute of Metals.

C. J. Mesta, formerly vice-president and general manager of the Hubbard Steel Foundry Company, Chicago Heights, Ill., has resigned to accept the position of assistant to George Mesta, president Mesta Machine Company, Pittsburgh.

John P. Pero, Jr., who has been vice-president and general manager of the Franklin Park Foundry Company, Franklin Park, Chicago, has been elected president to succeed James P. Walsh, who died at his home in Pittsburgh August 22. Mr. Pero will continue as general manager.

Andrew R. Johnson, who has had long experience with the Follansbee Brothers Company, Pittsburgh, has been appointed manager of its Chicago office. Edwin G. Fisher has resigned.

H. J. Kleinman has resigned as secretary and treasurer of the Cressman-Kleinman Mfg. Company, to take charge of the new office in the Morris Building, Philadelphia, as the district sales manager of the Central Tube Company, Pittsburgh, with territory of eastern Pennsylvania, New Jersey, Delaware, Maryland and Virginia.

George P. Thomas has resigned as manager of sales of the Trumbull Steel Company, Warren, Ohio.

D. T. Williams has resigned as president and director of the D. T. Williams Valve Company, Cincinnati, Ohio.

H. F. Noyes, formerly general superintendent of the Dayton Coal & Iron Company, has been appointed superintendent of blast furnaces for the Broken Hill Proprietary Company, Ltd., Newcastle, New South Wales, Australia.

The Hoyt-Noe Steel Company, Monroe and Jefferson streets, Chicago, has purchased the Brown-Lewis Railway Supply Company, Chicago, and has now associated with it, as the head of its tool steel department, James S. Lewis, who will handle the Toledo steels formerly marketed by the Brown-Lewis Company in addition to the lines that have been supplied by the Hoyt-Noe Steel Company.

The output of the Clyde shipbuilding yards in August was the smallest since 1886, being 12 vessels with a tonnage of 15,620.

Book Reviews

The Tin Plate Industry.—By J. H. Jones, M.A., lecturer in Social Economics in the University of Glasgow, honorary director of the Glasgow School of Social Study and Training. 284 pp., 5½ x 8½ in.; cloth. Published by P. S. King & Son, London. Price, 7s. 6d.

It is fortunate for the reviewer that his task is to set forth "What is the book?" and not "Why is the book?" for the latter alternative would be difficult to compass. The book is not a description of the tin plate industry as it exists, nor is it a history of the industry. Apparently it is intended as a study of the economic history of the industry, but when the author frankly says in his preface, "Nothing has been written on profits," expectations in this direction are greatly reduced, and the text fully justifies the reduction.

If it is a remarkable thing that in a minor branch of the iron and steel industry there should have occurred, during more than half a century, sweeping changes in the character of raw materials employed, in the rates of wages paid, in the organization of the men and in the prices and distribution of the finished product, then possibly there is occasion to single out the tin plate industry and write a book about it, in order to differentiate it from other industries. But if the history of the Welsh tin plate industry—for the American industry is but briefly and incidentally covered, while the German industry is scarcely mentioned—only [illegible]es the natural flux which normally occurs in ma[illegible]g industries, and we cannot see that it has done much more, then a study of the details of the economic changes can be useful only by way of throwing light upon the future and perhaps of giving advice to the manufacturers or workmen as to what they would better do in present circumstances. The reviewer's last disappointment was to find that the book wound up with practically no recommendations, other than that it might be well for the ownership of the mills to be amalgamated. We were under the impression that for more than a year past the Welsh tin plate trade had been shaken throughout by a contest between manufacturers and men over the style of working, the makers having installed mills capable of the heavy driving practiced in the United States, necessitating the employment of helpers in order to obtain the full output promised by the physical capacity of the mill, the men, however, refusing to adopt the American style of working and thus preventing a realization of the outputs clearly promised by the character of the mills installed. The book has not a word of reference to this issue, though published in 1914 and containing in the text an addition of two pages dated March, 1914.

The quantity of historical information the author has been able to gather is surprising, but of its quality and bearing upon the interests of to-day nothing favorable can be said. The style is pedantic in the extreme, though it is doubtful if anyone could have made the facts interesting. It is a strain upon the reader's attention to pass to the bottom of the page and read footnotes like the following: "1. Apparently at Pontypool"; "3. The defective plates being sold at lower prices as 'wasters'"; "1. But it is still in the experimental stages"—and others equally capable of inclusion in the text.

Steel Working and Tool Dressing.—By Warren S. Casterlin. Pages 207; 8 x 5¼ in. Published by M. T. Richardson Company, 73 Murray street, New York City. Price, $2.

This book is a manual of practical information for blacksmiths, written by a smith who has had over fifty years of actual experience at the anvil and who started as a boy with only a few months' education in a country school. It starts out with the process of manufacture of the irons and steels that are included in the blacksmith trade. Steel temper and treatment are covered, including the heating and cooling, as well as the blacksmith's tools, his anvil and fire. There is much useful information covering such work as would come to a jobbing shop and numerous shop kinks for the welding of wagon tires, dressing of chisels and tools and the making of drills and reamers.

The metallurgy of the book is poor. Most of the writer's experience was gained before much was known of alloy steels. He apparently has not kept up with the great advance in recent years and the use of gas, oil or electric furnaces operated under pyrometric control, which now enables the smith of ordinary intelligence, if he follows the directions laid down by the reliable manufacturers of steels, to be sure of his results.

Poor's Manual of Industrials for 1914.—Pages 2500, 5¾ x 8¾ in. Published by Poor's Railroad Manual Company, New York. Price, $7.50.

The 1914 or fifth annual number of this valuable manual contains about 300 pages more than any previous issue. Nearly 750 companies have been added and many new income accounts and balance sheets. The tables are mostly in comparative form. Information is given wherever possible showing whether bond interest is payable without deduction for the normal United States income tax. An appendix gives late information on railroads and public utility companies, supplementing the two manuals devoted to those interests. The publication of this latest volume completes Poor's Manual for 1914. The three books together contain over 6500 pages, covering the entire field of corporate investment in America. They give statements of practically every corporation in which there is a public interest, and are marked by accuracy, completeness and thoroughness.

The new handbook of the Lackawanna Steel Company, Buffalo, N. Y., edition of 1915, with over 450 pages, gilt-edged and bound in flexible leather covers, has appeared. About 110 pages are given over to sections of rails, bars, beams, sheet piling and other shapes with tables for the different weights and sections. The next section of the book is given over to the manufacturers' standard specifications, including the revision of 1914, for structural steel, for billets for forging purposes, for concrete reinforcing bars and the like, together with the standard classification effective on steel plates, shapes and bars. The remainder of the book, over 300 pages, is devoted to an unusually complete presentation of the statics of structural steel with numerous tables of the properties of different sections calculated to facilitate the design of steel work. These tables include radii of gyration, moments of inertia and moduli of sections, for both single sections and built up construction. The scope and completeness of the engineering tables completing the book are also particularly noteworthy. The company has placed a price of $2 on the book.

The Brown & Sharpe Mfg. Company, Providence, R. I., has issued a book entitled "A Practical Treatise on Milling and Milling Machines." An effort has been made to treat the subject in as non-technical a manner as possible and to present information that will assist the beginner and practical man to a better understanding of the care and various uses of modern milling machines. Instructions on the erection and care of the machines are given, together with notes on indexing and cutting spirals. There are over 120 pages of tables for indexing, approximate angles for cutting spirals and all the leads that can be obtained with any possible combination of the change gears furnished with the universal machines of the company. The book is bound in heavy paper and cloth covers, the price for the two styles being $1 and $1.50, respectively.

Slings for hoisting are discussed in the Travelers' Standard, a monthly publication of the Engineering and Inspection Division of the Travelers' Insurance Co., Hartford, Conn. It is an illuminating article regarding precautions which should be taken in placing a sling about a load so that excessive strains are not likely to be put on the chains or cables used. Some illustrations are included to indicate the stresses developed as the result of the angularity or obliquity of the sling in relation to the lifting or pulling member.

The Machinery Markets

In spite of the world-wide damper which has been placed on business of all kinds and because of which the machinery trade has suffered particularly heavy losses there is an optimistic feeling in many parts of the country, based on indications that the tide has turned. The better trend is felt in New York, where the accumulation of inquiries must soon develop into activity. The fact that the Interstate Commerce Commission is going to re-open the freight rate question for the Eastern railroads is an encouraging factor. In Detroit a moderate increase in business continues and while requirements are not heavy, inquiry is fair; manufacturing conditions are better and payrolls are being added to. There is an optimistic feeling in Cleveland, where some export orders have been received, though domestic business still is light. Machine tool builders in Cincinnati report a change for the better, the financing of foreign deals is becoming easier and some export orders are booked. Business drags in Milwaukee, though farm engines and agricultural machinery are in good demand. Conditions are bad in the Central South. In St. Louis there has been a gradual improvement in demand and the financial situation is more encouraging, though current business still is light. The low level of activity is unchanged in the Birmingham district, though the "buy-a-bale" of cotton plan is having a stimulating effect. In Texas hundreds of cotton warehouses are being built at an average cost of $5000. Manufacturing conditions are in better shape on the Pacific coast and wage-earners are banking their wages. In San Francisco several machine tool houses report the best week in some time, with small inquiries particularly numerous.

New York

NEW YORK, September 23, 1914.

There is a slightly better trend in this market. It is not evidenced to any great extent by sales, particularly of machine tools, but inquiry of a sort that looks like business is coming out in better volume. The inquiry which has been accumulating indicates splendid business when money becomes more active. That there is a change for the better is stated with positiveness by the representative of a machine tool company in this city who says that within two weeks he expects to close an exceptionally good sale and already he has done well this month.

The Watson-Stillman Company, Aldene, N. J., has been awarded the contract for equipping the hydraulic shields to be used in boring the new East River tunnels, New York. Ten shields, which are to be supplied by the Bethlehem Steel Company, will be used. The equipment which the Watson-Stillman Company will supply consists of hydraulic jacks for forcing the shields forward, pipes, valves and fittings; erectors of the hydropneumatic type, using motors for revolving the erecting arm, for placing the tunnel segments in position and hydraulic cylinders for lifting and placing operations. Each shield will require 17 jacks. The contract involves upward of $100,000. The Watson-Stillman Company was not the lowest bidder, but its experience in the building of such equipment was considered by the contractor, the Flinn-O'Rourke Company, Inc.

The Taylor-Wharton Iron & Steel Company is about to place orders for about $75,000 worth of cranes to be used in its new plant at Easton, Pa. Much other machinery will be required by the company and lists are understood to be almost ready for the trade.

F. H. Quimby, 99 Nassau street, New York, has completed plans for a three-story brick extension to the sawmill of Mary L. Barbey, J. & F. Eifert, lessees, Avenue D and Thirteenth street. The total cost will be about $15,000.

The Marconi Wireless Telegraph Company of America, Woolworth Building, New York, is having plans prepared for an $80,000 wireless station to be erected at Astoria, Ore.

The Highlander Machine Company, 413 Chamber of Commerce Building, Rochester, N. Y., recently incorporated to manufacture household laundry equipment, is having its patented washing machine manufactured by contract for the present but will eventually establish its own factory. H. H. Hopcraft is president and O. F. Gurney secretary.

The Aluminum Container Corporation, Fulton, N. Y., has been incorporated with a capital of $100,000 to take over the business of the Fulton Specialty Company, and will manufacture aluminum boxes, containers, screw caps, aluminum novelties and specialties. L. W. Emerick is president and C. E. Guile, secretary.

The Mohawk Valley Mfg. Company, Oneida, N. Y., will build a factory for the manufacture of automobile supplies.

The Tracy Development Company, Waterloo, N. Y., which has secured water rights along the Seneca River, has let the contract for the construction of a power plant building to the Locker Construction Company. The cost, exclusive of equipment, will be $98,540.

The contract for the construction of a brick and steel addition to its power house to cost $30,000 has been awarded by the Ithaca Traction Company, Ithaca, N. Y., to Frederick T. Ley & Co., Springfield, Mass. Plans have been prepared by Ford, Bacon & Davis, engineers, 115 Broadway, New York.

The Public Service Commission, Albany, has granted permission to the Central Hudson Gas & Electric Company for two extensions of its plant and the exercise of two new franchises.

The Remington Arms & Ammunition Company, Ilion, N. Y., has let the contract for the erection of several buildings to be added to its manufacturing plant; the largest will be 40 x 240 ft., four stories and basement, of mill construction.

The Geneva Cutlery Company, Geneva, N. Y., is building a 40 x 70-ft. addition to its plant for the manufacture of razors.

The Oswego Machine Works, of Oswego, N. Y., of which Niel Gray is president, is taking bids for the construction of an addition to its machine shop, to be 95 x 145 ft., two stories.

New England

BOSTON, MASS., September 22, 1914.

Since the opening of the European war, business has passed through a series of reactions. Under the influence of the first, men became optimistic. They looked ahead and saw new fields of export business. But they overlooked the fact that there must be an interim while finance and the other great factors of business are adjusting themselves to meet new conditions created with a suddenness wholly unprecedented. Instead of an immediate revival, a general depression was felt, and men talked gloomily as a rule.

Within the past week or ten days the third phase has set in. As one travels about, coming in contact with men representative of commercial and banking interests, he feels the change in a really tangible way. Bankers are more cheerful, with the easing up of the money stringency, and believe that normal conditions will return within a few months, following consistently the improvement that has come in the last week. Some lines of manufacturing are really busy, including woolen and worsted goods, laces, silks and, in the cottons, the narrow fabrics and the finer goods which will replace imports from Europe. Toys and other similar goods in which Germany has specialized are being manufactured in great quantities.

The cutlery manufacturers are receiving tangible proof that they are to benefit immediately by the war. Importers of European cutlery are making inquiry in the trade for American goods which will replace what was formerly obtained chiefly in Germany. The War Department has placed an order for 10,000 razors with an American manufacturer; recently German razors have been winning out in their bids on our Government contracts, because of lower prices.

The business of Charles L. Chase & Son, Leominster, Mass., manufacturer of steel wool, is exceedingly prosperous because of the falling off in imports from Europe, especially from Germany. The Leominster firm is receiving orders which tax the capacity of the factory to its utmost, and plans are being made to increase equipment, because the improvement in general business should have a direct effect in increasing demand to a much greater magnitude.

The woolen and worsted business in New England is quite active, and the prospect is of steady improvement. In some cases overtime work has begun, and the promise is that conditions will become quite general. Few skilled woolen workers will be out of employment in a very short time. To quote the statistics of the National Association of Wool Manufacturers the percentage of idle woolen spindles in the United States was 22.5 on September 1 as compared with 25.8 on June 1; and the percentage of idle worsted spindles September 1 was 16.9 as compared with 18.1 on June 1 and 22 on March 2.

The cotton manufacturing industry is dull, owing to the uncertain prices of the raw material, and also to the as yet unknown factor of the new foreign market. The narrow fabric manufacturers are busier, and the builders of their equipment are correspondingly more active, in fact are doing a pretty good business, the increase having been marked in the last fortnight. Woolen machinery generally is in good demand, and many repair parts are being sold, which is an important part of the business. As a whole the cotton machinery business is dull, but some of the builders express confidence that the depression in their line is one that should not have long duration.

The wire business is pretty good. The mills are running fairly full; at least two of the large New England independent companies are operating at about 90 per cent. capacity, and the tendency is to take on more men rather than to let them go.

The English branches of American machinery and supply manufacturers are fairly busy, but most of the product is going to the government. One such branch has lost about 50 per cent. of its working force because of the calling of the men to arms. A similar activity is reported by American branches in other countries that are engaged in the war.

The machine tool business is dull enough. Some comfort was had from the fact that nearly $50,000 worth of equipment was sold in two days at the recent foundry convention at Chicago. But the demand is small and works are running short hours and with reduced forces.

The Standard Bolt & Nut Company, Valley Falls, R. I., has awarded the contract for an addition to its factory, which will be 40 by 60 ft., one story.

The Birmingham Iron Foundry, Derby, Conn., manufacturer of machinery, rolls and iron and semi-steel castings, has awarded the contract for an additional machine shop, 93 by 154 ft.

A. N. Wetherbee, Lyndonville, Vt., will rebuild the burned factory of the Novelty Works of that town.

The factory of the Toy Crafters, Inc., Fitchburg, Mass., was burned September 18, with a loss of $30,000.

The Pittman & Brown Company, Salem, Mass., will replace its woodworking plant which was burned in the great fire last June.

The Rumford Chemical Works, Rumford, R. I., will build a two-story addition, 25 by 60 ft., for its antichlorine department.

The Holyoke Box & Lumber Company, Holyoke, Mass, will rebuild the plant recently destroyed by fire.

Baer Brothers, Stamford, Conn., will erect an additional building, 49 by 131 ft., one and two stories.

The Germania Mills, Holyoke, Mass., will build a power house, 60 by 100 ft., with ell 24 by 33 ft., and a one-story dye house 60 by 181 ft.

Oscar Nelson, Portland, Conn., will erect a building which will be used as a machine shop.

The Eureka Ruling & Binding Company, Holyoke, Mass., has made plans for a factory building, 100 by 115 ft., three stories, of brick, mill construction.

Ashworth Brothers, Charlton, Mass., textile manufacturers, will build an addition to their mill.

Philadelphia

PHILADELPHIA, PA., September 21, 1914.

The Independent Mfg. Company, 3017 Edgemont street, Philadelphia, manufacturer of tallow, bone, etc., is building a two-story concrete factory, 33 x 50 ft., to cost $6500. All the machinery has been ordered except a Burnham vacuum pump. E. D. Smith is president.

The E. J. Schoettle Company, 237 North Sixth street, Philadelphia, Pa., manufacturer of boxes, is having plans drawn for a six-story factory, 110 x 112 ft., to be erected at Eleventh and Brandywine streets. The plans will not be completed for at least two months.

The Economic Power & Products Company, Lafayette Building, Philadelphia, will establish a plant in Tennessee or some other cotton state for the purpose of manufacturing paper pulp from cotton stalks. M. W. Marsden, William D. Miller and John B. Mayer are a committee which is investigating the question of a suitable location.

The Marietta Hollow Ware & Enameling Company, Marietta, Pa., will erect a one-story concrete addition to its factory, 70 x 70 ft., to cost about $8000. J. W. Russel is manager. John Wickersham, Breneman Building, Lancaster, Pa., is the engineer.

Chicago

CHICAGO, ILL., September 21, 1914.

The Triple Action Spring Company, Chicago, manufacturer of the Johnson shock absorber, is making big additions to its factory at East Twenty-eighth street near Michigan avenue. The new plant will afford 29,000 ft. of floor space, which will enable the company to double its output.

The C. E. Dellenbarger Machinery Company, 617-631 West Jackson boulevard, Chicago, will move to Joliet within a month. The company is capitalized at $75,000 and manufactures confectionery machinery. It will occupy the plant of the Economy Motor Car Company, following the necessary alterations and improvements in plant and equipment.

The Clinton Steel & Wire Company, Chicago, has just acquired a building site in the machinery district and plans the immediate erection of a $60,000 building.

The Alma Heater Company, Chicago, has been incorporated with a capital stock of $10,000 to manufacture and deal in heating supplies, apparatus, etc. The incorporators are Charles Smith, George L. Richards and Olive L. Richards.

Philip F. Carroll, president of the Champion Machinery Company, manufacturer of bread-making machinery, Joliet, Ill., has sold out his entire stock, a controlling interest, to William Fay, former manager, and E. A. Clark, superintendent. Extensive improvements in the plant will increase the output of the factory from $200,000 at the present time to $300,000 inside of a year.

The new plant to be erected by the F. Meyer & Brother Company, Peoria, Ill., will not be built on the location of the old one which was destroyed by fire recently, but in a part of the city where the shipping facilities are better.

The Paramount Knitting Company, Kankakee, Ill., is to construct a fire-proof factory, 50 x 145 ft., eight stories, to have over 55,000 ft. of floor space.

T. H. Smith, of Detroit and Chicago, mechanical engineer of the Wilson Tire & Rubber Company, has been purchasing and shipping machinery to be placed in the latter's new plant which is now nearing completion at Harvard Park, Ill.

The South Bend Lathe Works, South Bend, Ind., has been incorporated by M. W. O'Brien, A. L. O'Brien and J. J. O'Brien with a capital stock of $20,000 to manufacture lathes and other machinery.

Vance & Baker, Muscatine, Ia., manufacturers of canning machinery, have acquired property in that city upon which will be erected a machine shop. The building will occupy a plot 120 x 140 ft., and will have unusually good shipping facilities.

Capelle & Thurgood, Eldorado, Ill., will build a machine shop and automobile garage.

Aurelia, Iowa, has voted $7000 of bonds for the construction of a municipal electric light plant.

The Oakford Telephone Pole & Line Company, Oakford, Ill., has been incorporated with a capital stock of $600,000 by Ira A. Smith, Henry Brauer, Hardin A. Lounsberry, J. W. Lynn and John C. Schadd and will engage in telephone and telegraph equipment business.

The Western Mausoleum Company, Galesburg, Ill., has been incorporated with a capital stock of $25,000 by J. F. Brower, Harry F. Kimber and M. J. Copeland and will engage in the manufacture of burial appliances, etc.

Stanton, Iowa, will receive bids until October 1 for a triplex pump and a gasoline engine or electric motor. C. G. Carlton is town clerk.

Frederick and A. S. Duesenberg, Des Moines, Ia., automobile manufacturers, will soon erect a factory for the manufacture of Duesenberg engines and cars. The factory, it is stated, will probably be located at Dallas, Ill.

Work has been started at the plant of the Illinois Refrigerator Company, Clinton, Iowa. New boilers are being installed, as well as dynamos and electric motors to replace the shaft and belt system.

Work has been begun on the new brick and concrete factory building for the Lennox Furnace Company, Marshalltown, Iowa. It will be composed mostly of glass with metal sash and will have a ground area 96 x 432 ft.

The Ware Motor Vehicle Company, 771 Raymond avenue, St. Paul, Minn., which has arranged for the erection of a factory at University avenue and Pelham street, has delayed its plans until next spring, when the building will be finished. J. L. Ware is manager.

H. M. Shoemaker, city auditor, Alexandria, S. D., will receive bids until October 5 for furnishing and installing a complete municipal electric light system.

Buhl, Minn., has voted $50,000 of bonds for improvements to the power plant, etc.

Indianapolis

INDIANAPOLIS, IND., September 21, 1914.

The Veedersburg Power Company, Veedersburg, Ind., has increased its capital stock from $100,000 to $125,000.

The Reed Embosser Company, South Bend, Ind., has been organized to manufacture machines for the printing trade. The directors are F. C. Klein, William Bender and G. W. Zinky.

The Jackson Shovel & Tool Company, Montpelier, Ind., is in the market for a 400 or 450-lb. board drop hammer. S. C. French is manager.

Elmer Day, Evansville, Ind., will buy machinery for a repair shop and garage, plans for which are now being drawn.

The Amo Light, Heat & Power Company, Amo, Ind., has been incorporated with $3000 capital stock for public utility purposes. The directors are W. W. Cosner, E. B. Owen and J. E. Hodson.

The Richmond Handle Company, Richmond, Ind., has filed notice of dissolution.

The Electric Machine Company, New Albany, Ind., has been incorporated with $6000 capital stock to manufacture electric vending machines. The directors are Ferdinand Kahler, Sr., H. Lobach and Ferdinand Kahler, Jr.

The Jeffersonville Motor Car Company, Jeffersonville, Ind., has been incorporated with $10,000 capital stock to manufacture automobiles. The directors are F. D. Deitrich, William Kilgus and Donald Williams.

Milwaukee

MILWAUKEE, WIS., September 21, 1914.

The activity in production and sales shown by manufacturers of farm gasoline engines, implements and farm machinery of all kinds, is the most encouraging feature of a discouraging situation in Milwaukee and Wisconsin. Machine-tool makers are finding the agricultural manufacturer the best source of business. In all other lines business is dragging and industrial heads find it difficult to maintain optimism. September will fall behind August in volume of business, the first half of the month having shown no signs of a revival. All buying shows every indication of actual and pressing need and but for such imperative replacements it is hard to imagine how production could be maintained even so well as it is.

A new aluminum industry is about to be added to the many plants of this character in Two Rivers, Wis. The Onlie Kooker Company, with $25,000 capital stock, has been incorporated by I. E. Miller, Frank Riley, Herman Wentdorf and A. L. Wallham to manufacture aluminum cooking utensils, steel cabinets and office furniture, etc. The promoters are not ready to divulge plans for production and distribution.

The L. F. Schoelkopf Automobile Company, Madison, Wis., is now taking figures for the erection of a garage and machine shop, which, as previously reported, will be 50 x 120 ft., four stories, of reinforced concrete and steel. The estimated cost is $55,000. A. E. Small is the architect. The company will buy a considerable list of equipment at once.

The Oshkosh Steel Construction Company, Oshkosh, Wis., will move to larger quarters at 35-37 Jackson street. It is in the market for a punch, shears and saw, all driven by individual electric motors. E. L. Mundin is manager.

The Olsen Concrete Mixer Company, Elkhorn, Wis., is buying a small list of power-driven tools for installation in the plant of A. G. Olsen, who recently organized the corporation with $20,000 capital stock. Next spring the company expects to build additions or an entirely new plant.

F. G. Pierce, Plainfield, Wis., will build a garage and repair shop to cost $4500.

A. R. Weins, Milwaukee, Wis., is about to establish a brush factory at Duluth, Minn. He expects to build a factory costing about $50,000, capable of producing hair, fiber and steel brushes to the amount of $250,000 a year.

Julius Simon will build an $18,000 garage at the northwest corner of Wells and Fourth streets, Milwaukee.

The Evinrude Motor Company, 279 Walker street, Milwaukee, will add one story to its present factory at a cost of $14,000.

Cleveland

CLEVELAND, OHIO, September 21, 1914.

A few new export orders have come from England, but no business is reported from continental Europe or other foreign countries. Domestic business with machine-tool builders, as well as business with dealers, continues light. Some scattering single tool orders were placed during the week, but no sales for more than single tools are reported. No new lists have come out. Some of the business that has been pending is still being held up. In spite of the dullness considerable hopefulness is being expressed by machine-tool builders. There is an unusual scarcity of new companies organized to engage in metal-working lines.

It has been announced that the Highland Milk Condensing Company will build a $100,000 plant in Minerva, Ohio.

George Berau and W. H. Drabers have purchased the plant of the Ohio File Renewing Company, Niles, Ohio, and will remove it to Cleveland.

The Iddings Company, Warren, Ohio, has been succeeded by the Warren Stamping Company, which will manufacture steel stampings, novelties and lanterns. The new concern will occupy the Iddings plant now used by the Standard Motor Truck Company.

The F. A. Herrick Company, Toledo, has been incorporated with a capital stock of $10,000 to manufacture fixtures for hardware stores.

The Buckeye Machine Company, Lima, Ohio, has been incorporated with a capital stock of $50,000 by E. L. Neiswander and others.

The Norwalk Drilling Tool Company, Norwalk, Ohio, has just moved into new quarters, which were necessitated because of its growing business. The new plant includes a main building and forge shop, 50 x 112 ft.; machine shop, 40 x 80 ft., and engine and boiler rooms.

The Hamilton Foundry Company, Norwalk, Ohio, will shortly place in operation a new foundry to replace the one recently burned. The new building is 40 x 128 ft.

The commissioner of purchases, Cleveland, will receive bids September 30 for an air compressor for a charging plant capable of compressing a pressure of 1400 lb. per sq. in.

S. Austin & Sons, Cleveland, Ohio, will build a factory at Niagara Falls, Ont., for the manufacture of chain. It will be 150 x 440 ft.; two stories, of reinforced concrete construction.

Detroit

DETROIT, MICH., September 21, 1914.

The moderate increase in business which was noted last week has continued and a fair number of sales are reported. There is still a lack of large requirements for equipment and while the volume of inquiry is better there are none reported which indicate any heavy buying. In special machinery some interest is being shown in sawmill equipment. Conditions among manufacturers may be said to be somewhat better than those prevailing a month ago, many factories are adding to their pay rolls and there is a disposition to look hopefully on the future. Collections are reported to be only fair. There has been an increase of activity in building circles.

The Electric Welder Company of America, Detroit, has been incorporated with a capital stock of $50,000 by E. B. Buckman, A. W. Mair and William F. Schultz to manufacture welding machinery of new design and has secured factory quarters.

The Stoddard-Jakel Tool & Machine Company, Detroit, has taken out a building permit covering the erection of a three-story factory, 58 x 80 ft., of reinforced concrete construction, to cost $17,000. It will be located at Woodbridge and Beaubien streets.

Berry Brothers, Detroit, varnish manufacturers, have awarded the contract for a small addition to their plant.

The Fenton, Mich., plant of the Henry S. Koppin Company, Detroit, manufacturer of interior finish and other lumber products, was destroyed by fire September 17, entailing a loss of $100,000. The plant consisted of five buildings and it is expected that it will be rebuilt.

The Detroit Lumber Company, Detroit, has taken out a building permit covering the erection of a one and two-story power house and garage to cost $15,000. The building will be 55 x 120 ft.

Creditors of the Lozier Motor Company, Detroit, manufacturer of automobiles, have petitioned for the appointment of a receiver for the concern. Lee E. Joslin, Detroit, has been appointed custodian of the company's property pending the outcome of the proceedings.

The Van Blerck Motor Company, Detroit, manufacturer of gasoline engines, has increased its capital stock from $100,000 to $135,000.

The Thompson Mfg. Company, Holland, Mich., manufacturer of furniture, has increased its capital stock from $50,000 to $100,000. Another story will be erected on the present building and some additional equipment will be installed.

The Safety First Motor Car Company, which was recently organized at Kalamazoo, Mich., to manufacture automobiles, will establish its plant at Plainwell, Mich.

The Holland Furniture Company, Holland, Mich., is planning to double the capacity of its plant. A factory will be erected this fall.

The Standard Wire Company, Saginaw, Mich., has been incorporated with $5000 capital stock and will engage in the manufacture of wire and iron goods.

The Universal Valve Company, Muskegon, Mich., has been organized by Martin Dowd, H. D. Baker, Elmer J. Peterson, and others. The new company proposes to engage in the manufacture of valves for sprinkler systems.

The Flint Varnish Works, Flint, Mich., previously reported as the Flint Varnish Company, is building an addition to its works at a cost of $26,000 and not $6000, as has been stated elsewhere. W. T. Glidden is assistant general manager.

Cincinnati

CINCINNATI, OHIO, September 21, 1914.

A number of local machine-tool builders report a decided change for the better. New business was received overnight, so to speak, and the general situation looks very much more encouraging. Orders continue to come in from both England and Russia, but it is supposed that a number of these are from a New York house that recently closed a large deal in England and may be parceling some of the business among other plants. The financing of foreign deals also seems to be easier than it was 10 days ago, and a fairly good-sized order from Russia was accepted by a resident firm last week. Domestic business is also on the mend. While orders still continue to be mostly for one or two machines, they are more plentiful, and there is a marked improvement in the number of inquiries received.

Wood-working machinery is slow, but small electric units are in good demand. Practically no call has been found for the larger sized outfits. The jobbing foundries are operating at about the same pace as during the past six weeks, but the stove foundries are speeding up some.

Bert L. Baldwin & Co., Perin Building, Cincinnati, are preparing plans for a large laundry plant to be constructed by Roben & Martin, Maysville, Ky.

Walter G. Franz, Union Trust Building, Cincinnati, will soon open bids for a heating system for the proposed isolation hospital to be erected by the city.

Contract has been let for the construction of an addition to the power plant of the Union Distilling Company, Cincinnati. Practically all necessary equipment has been purchased.

The Palmer Automatic Gear-Shift Company, 204 Post square, Cincinnati, has been incorporated with $10,000 capital stock by R. P. Palmer and others.

The Economy Electric Company, Hamilton, Ohio, has been incorporated with $10,000 capital stock by Melville L. Spencer and others. It intends to manufature small electric generating outfits for use in country homes.

The Hamilton Scale & Tank Company, Hamilton, Ohio, has decided to discontinue business.

The Urbana Light Company, Urbana, Ohio, will probably enlarge its power plant at an early date. The company has recently obtained contract for lighting the nearby village of Woodstock, Ohio.

The Kyle Mfg. Company, Lancaster, Ohio, announces that it will have its stove foundry in operation within the next 60 days. Very little new equipment will be required.

Wileman & Hobling, Ironton, Ohio, have plans under way for the erection of a brick plant near Ironton.

The village of Russell, Ohio, has voted favorably on issuing bonds for a municipal waterworks plant.

W. A. DeVoss, Portsmouth, Ohio, architect, will soon be ready for bids on heating equipment to be installed in an $80,000 municipal school building.

The Dunham Company, manufacturer of lawn mowers and other specialties, Berea, Ohio, will rebuild its paint recently destroyed by fire.

The Cincinnati Iron & Steel Company has just finished making a large shipment to a customer in Italy, including an assortment of its 14-in., 16-in. and 18-in. lathes. This company reports that both its domestic and export business is now on the mend.

Wheeling

WHEELING, W. VA., September 21, 1914.

The Logan County Light & Power Company, Logan, W. Va., has been incorporated with $1,500,000 capital stock to build power and light plants. The incorporators are George W. Stevens, Jr., E. S. Aleshire, Huntington, W. Va., and others.

The Marion Brick Company, Fairmont, W. Va., has been incorporated with $50,000 capital stock by Z. F. Davis, F. W. McIntire, O. J. Fleming, and others.

The Huntington Motor Company, Huntington, W. Va., has been incorporated with $5000 capital stock by B. E. Ware, R. H. Dickinson, E. N. Winn, and others.

The Paden City Pottery Company, Paden City, W. Va., has been incorporated with $75,000 capital stock by Walter B. Eichleay, William J. Herbster, Simeon T. Patterson, Pittsburgh, Pa., and others.

Birmingham

BIRMINGHAM, ALA., September 21, 1914.

The "Buy-a-bale" movement has had a stimulating effect, the price of cotton having already risen 2 to 3c. per lb., and this has caused more cheerfulness. The substitution of cotton for jute bagging has also had a good influence. Machinery dealers report a much improved feeling and are inclined to look for an early betterment in conditions. There has been no change other than this, and business is at a low ebb, especially for wood-working machinery and tools.

Bay Minette, Ala., will soon begin construction of a water system, electric lighting plant, etc., for which bonds have been voted. Edgar B. Kay, Tuscaloosa, Ala., is the engineer.

The A. J. Spencer Lumber Company, Mobile, Ala., will rebuild its sawmill, recently burned. The new plant will cost $25,000 and have a capacity of 50,000 ft.

The Dixie Pipe Company, Gadsden, Ala., of which Robert Campbell is general manager, will build a sanitary pipe plant.

The Allentown Power Company, Florence, Ala., has been incorporated with a capital stock of $20,000 to develop hydro-electric power on Cypress Creek and to build fertilizer plants, etc. N. F. Thompson, Birmingham, Ala., is president. Plans are not definite.

John C. Webb & Son, Demopolis, Ala., will establish a refrigerating plant.

Hopeville, Ga., has voted $29,000 of bonds for waterworks improvements.

The Big Salkehatchie Cypress Company, Varnville, S. C., will increase its capital stock from $300,000 to $500,000 and will erect a wood and concrete mill for the manufacture of shingles, laths, etc., to cost about $40,000. It is in the market for equipment including boilers, engines, locomotives, generator and machine shop equipment. H. B. Hewes, Jeanerette, La., is president, and E. C. Glenn, general manager.

William E. Dalloz, box 1008, Jacksonville, Fla., is in the market for a drill press, milling machine, hack saw, punch, bolt cutter for threading round iron and pipe, electric motor and emery wheel; and may also purchase a lathe, shaper and shears; all for an electrically-operated machine shop.

The Raleigh Iron Works Company, Raleigh, N. C., manufacturer of iron castings, will erect a foundry 40 x 100 ft., of mill type construction, to replace its present building and will install a 5-ton crane, hand power type, adaptable for use with electric motors. Wm. T. Harding is president and manager.

The Central South

LOUISVILLE, KY., September 21, 1914.

Not much change in business conditions has been noted the past week. The general tone of the machinery market is dull. The volume of business is not up to the average. Building operations have dropped off, and outside of the expenditures of the board of education, which is using $1,000,000 for school buildings, nothing big enough to require much equipment is going up in this immediate territory. The unsettled condition of the cotton market has disturbed the cotton manufacturing industry, and most of the mills are running below normal capacity and are buying little equipment. Some machinery houses are getting into the "Buy a Bale of Cotton" movement for the purpose of assisting to relieve the market. Most of the business now being handled consists of small items, few large projects being in a position to secure the necessary financial backing.

The Bluegrass Motion Picture Mfg. Company, Glenarm, Ky., near Louisville, has been incorporated with $35,000 capital stock and is establishing a plant. A generator,

motors, etc., will be required. Address George H. Kendrick, manager.

The Modern Woodworking Company, Louisville, has been incorporated with $10,000 capital stock and will equip a plant. Three 20-hp. motors, a ripsaw, bandsaw, two planers, jointer, mortiser, sanders, lathe, etc., will be needed. Frank Hillerich, 539 Garden street, is in charge of the purchases.

The Montgomery Pulverizing Company, Mt. Sterling, Ky., will build a plant for grinding limestone. James Hutsell is president.

Hazel, Ky., is installing an electric lighting plant and water system. The powerhouse will be 20 x 50 ft.

Two additional prizing rooms, 50 x 80 ft., are to be equipped by the Farmers' Loose Leaf Warehouse Company, Eminence, Ky. Power machinery and presses will be needed.

The New Munfordville Electric Light & Power Company, Munfordville, Ky., has taken over the plant and business of the Munfordville Electric Light & Power Company and is planning improvements.

J. L. Falkner, Goldsboro, N. C., is planning the establishment of a tobacco redrying plant at Danville, Ky. Boilers will be needed.

Kirk Brothers, Maysville, Ky., plan the erection of a garage and its equipment for automobile repair purposes.

Hudson & Davis, Danville, Ky., are purchasing power and conveying equipment for a coal elevator.

The Buchanan-Lyon Company, Campbellsville, Ky., will erect a building, 50 x 100 ft., for use as a garage and repair shop. Equipment needed for the shop will include a motor, machine tools, etc.

The Greelsburg Loose Leaf Tobacco Warehouse Company, Greensburg, Ky., will purchase equipment, including engines and presses, for two additional prize-rooms, 60 x 150 ft. each. Gasoline engines will probably be used.

Stewart W. Shrader, Lexington, Ky., is equipping a metal-working shop, which will be operated as J. J. McGuff & Co. Sheet metal working machines will be installed.

The Fox Brothers Company, Hopkinsville, Ky., whose plant was recently burned, will erect a new plant. Cold storage equipment will be installed. Frank Fox is in charge.

Frank D. Anthe, Covington, Ky., is building an automobile repair shop at 411 Madison avenue.

The Kelsay Hame Company, Evansville, Ind., is completing a foundry and is now purchasing equipment for it.

A new cement mill is to be built at Arthur, Tenn., near the Kentucky line, by Cleveland, Ohio, interests. The industrial department of the Southern Railway, Washington, D. C., can furnish information regarding the project.

The Tennessee Garage Company, Memphis, Tenn., has been incorporated with $10,000 capital stock by Joseph Friedlander, and others, and will probably need some equipment.

The Dandridge Power & Light Company, Dandridge, Tenn., has been organized and is preparing to erect a power plant. A gasoline engine, generator, etc., will be installed.

The Kent Oscillating Cattle Guard Company, Johnson City, Tenn., is marketing a device for use by railroads in transporting live-stock. The company is having the guard made by contract at present, but is considering the establishment of a factory. Victor E. Kent is president.

St. Louis

ST. LOUIS, Mo., September 21, 1914.

No large lists of machinery are appearing and the aggregate of business is light; but the gradual improvement in the business and financial situation is having a beneficial effect on buying, which is reasonably well spread over this territory. The sections dependent upon the cotton crop are of course the slowest in developing business revival, but the grain and general agricultural areas are showing an advance that is encouraging. Some purchases of single tools in the market and some little inquiry for second hand machinery have been noted. Collections are reported satisfactory and general banking conditions favorable to the improvement of business.

The Bussmann Mfg. Company, St. Louis, has been incorporated with a capital stock of $12,000 by A. B., H. T. and B. Bussmann, to manufacture electrical equipment and do a general machine shop business.

The St. Louis Welding Company, St. Louis, has been incorporated with a capital stock of $150,000 by Leo Ganahl, George Becherer, and others, to do a general metal welding, forging, machine and foundry business. It will also manufacture automobile wheel rims.

The Eberle Cornice Company, St. Louis, has been incorporated with a capital stock of $10,000 by John, Herman J. and William T. Eberle, to engage in the manufacture of building sheet metal work, fire windows and doors, etc.

The Laclede Gas Company, St. Louis, has taken out the necessary permits for the construction of further units in its by-product coke and gas plant, which are to cost about $750,000.

The Continental Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $100,000 by Peter A. F. Appelboon, A. F. Lowry and William E. Morton.

The B. C. Hoefer Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $60,000 by B. C., F. A. and S. H. Hoefer, and will equip a plant.

The Independence Ice & Cold Storage Company, Independence, Mo., has increased its capital stock from $75,000 to $100,000 for the purpose of increasing its plant.

The Central Coal & Coke Company, Kansas City, Mo., through its subsidiary, the Delta Land & Timber Company, will rebuild its burned plant at Carson, La., expending about $250,000 and developing a capacity of 150,000 ft. daily, including dry kilns, two band saws and one gang saw, with power plant, etc.

A brick plant, to cost about $35,000, with a capacity of about 30,000 brick daily, will be erected at New Florence, Mo., by the Chicago Fire Brick Company, Chamber of Commerce Building, Chicago.

The H. J. Brunner Hardware & Machinists' Supply Company, Kansas City, Mo., has been incorporated with a capital stock of $10,000 by M. E. and F. X. Brunner and E. B. Hohenschild.

The West End Auto Repair Company, St. Louis, of which H. Clise is owner, will install additional machinery.

Kirksville, Mo., will install boilers to cost about $2500 and pumps to cost about $5000, in connection with its recent decision to extend the capacity of the waterworks plant.

Arkadelphia, Ark., has granted a new franchise to the Arkansas Power Company, under which it will install pumps and a filtering plant at its works.

The Waldron Planing Mill Company, Waldron, Ark., has been incorporated with a capital stock of $16,000 by J. S. Hill, and others, and will operate a planing mill.

J. A. Reece, Blytheville, Ark., will erect and equip a factory and engage in the manufacture of water filters, etc.

The W. F. Brawley Motor Company, Argenta, Ark., has been incorporated with a capital stock of $10,000 by W. F. Brawley, John D. Staples and W. R. Deener, and will establish a machine shop for repair work.

Carl Shuey, Hot Springs, Ark., is reported in the market for equipment for continuous limekilns and other apparatus for lime manufacture.

Pond Creek, Okla., will install a 50-kw. generator, with exciter; a 50-hp. internal combustion engine and two 20-hp. single-phase motors with two centrifugal pumps. C. C. Sheppard is superintendent.

The Henryetta Boiler Works, Joplin, Mo., of which A. Eyster is president, will equip a plant for the manufacture of boilers, smoke stacks and tanks at Henryetta, Okla.

The Baker Steel Tie Company, Oklahoma City, Okla., has been incorporated with a capital stock of $10,000 by S. Webb, W. F. Baker and R. S. McCabe, to manufacture steel ties.

The Indiahoma Refining Company, Bristow, Okla., is reported to intend the equipment of a pipe line from Bristow to Okmulgee with pumps, etc., to deliver 2000 bbl. daily.

The Inola Pipe Line Company, Inola, Okla., has plans for a pipe line, from the Cushing field to Chanute and Coffeyville, Kans., to cost $1,000,000, including pumps, etc.

Blackwell, Okla., has plans for an ice plant of undetermined capacity. The mayor is in charge.

The Rice Auto Company, Blackwell, Okla., will build a garage and will install machinery for repair work.

Okemah, Okla., has formally authorized a bond issue of $25,000, to be expended on additional waterworks equipment.

The Meridian Car Works will be incorporated at Meridian, Miss., by S. A. Neville, and others, to engage in building cars and repair railroad equipment. Some machinery will be required.

The Okolona Ice Factory, Okolona, Miss., of which John K. Kaye is proprietor, will install cold storage equipment and also a compressor of about 3 tons capacity.

The Illinois Central Railroad, of which A. S. Baldwin, Chicago, is chief engineer in charge, will build at Asylum, Miss., a roundhouse, coal chute, turn tables, water tank, etc., to cost about $50,00.

The Meridian & Memphis Railway, of which S. A. Neville is vice-president, will build a shop and roundhouse at Meridian.

F. M. Spinks, Shubuta, Miss., will install a wood working plant in connection with his ice plant and is in the market for the necessary machinery.

The plant of the Scranton Shingle Company, Pascagoula,

Miss., is reported burned with a loss of $7000, which will be replaced.

The Alexandria Cotton Oil Company, Alexandria, La., has been incorporated with a capital stock of $80,000 by S. H. Brown, A. P. Coles and R. G. Riley, and will erect a plant at once.

The Bunkie Ice Company, Bunkie, La., is about to acquire the municipal lighting plant and will install an internal combustion engine, generators and other equipment, changing from direct to alternating current.

New Orleans, La., capitalists, including Martin Beherman, the mayor, have plans for a $10,000,000 hydroelectric plant, to be built about 50 miles from New Orleans, for public service purposes in New Orleans and nearby cities.

The pumping plant which the state of Louisiana is constructing near Lake Charles, as a part of the Jefferson-Plaquemine drainage and reclamation project, will cost about $350,000. It will have a capacity of 1,000,000 gal. per min. About 35,000 acres of swamp land are to be drained and made available for cultivation.

Texas

AUSTIN, TEXAS, September 19, 1914.

An agitation for the construction of more cotton mills in Texas is widely spreading as a result of the demoralized condition of the foreign market for raw cotton. Hundreds of warehouses are being erected in Texas to provide storage for the cotton crop. The demand for irrigation pumping machinery in western Texas continues remarkably good and in Arizona and New Mexico considerable machinery for mines is being sold.

L. Frank & Co., New Orleans, La., will construct a packing plant at Austin. They will also establish similar plants at Lampasas, Brownwood, Sweetwater, Giddings, Cisco, Taylor and San Antonio.

It is announced that special inducements will be offered by the city commission of Austin for the establishment of one or more cotton factories to utilize the excess electrical power that will be available when the municipal hydroelectric plant is finished.

The tax-payers of Lufkin have voted to issue $15,000 of waterworks improvement bonds.

The plant for mining and crushing Fuller's earth which R. A. Brantley, Somerville, and associates, have been operating, will be enlarged in order to meet the increased demand caused by the closing of the foreign sources of supply.

The San Antonio, San Jose & Medina Valley Interurban Railway Company, San Antonio, has adopted plans for building a town at the proposed terminus of its line at Medina Dam. The new town will be provided with modern public utility plants.

Phelps, Dodge & Co., 99 John street, New York City, will construct a power plant at Tyrone, Ariz.

The Central Coal & Coke Company, Carson, La., will rebuild its sawmill which was recently destroyed by fire, entailing a loss of about $500,000. The mill had a daily capacity of 150,000 ft.

San Francisco

SAN FRANCISCO, CAL., September 15, 1914.

Notwithstanding the holidays last week several local machine-tool houses report the best week in a long time. The volume was not large except as compared with the recent dullness, practically all sales being of single tools or small groups out of stock; but the buying was well distributed, including both local and country shops. Merchants are now convinced that this month's business will run well ahead of August. Whether this slight acceleration will continue is by no means certain, but small inquiries are fairly numerous and there is undoubtedly a better feeling in the trade. The immediate outlook for large purchases, however, is not favorable, either in machine tools or general machinery, as money for investment is scarce and commercial conditions are too unsettled for general expansion. A few rather large inquiries have appeared, however, for contractors' and road-building machinery, mainly for use on public work.

The Contra Costa Iron Works, Crockett, Cal., has been organized by M. C. Lamb and E. Little and has leased a foundry at that place. It is preparing to turn out brass, bronze and aluminum, as well as iron castings.

The Standard Oil Company, Richmond, Cal., is making plans for the enlargement of its present ship repair plant to give it sufficient capacity to make all repairs to its fleet of nearly 50 vessels operating from San Francisco.

The Midlands Oilfields, Maricopa, Cal., is installing an oil pump of 12,000 bbl. daily capacity.

The Universal Tire Company, Anaheim, Cal., is putting in machinery for the manufacture of automobile tires, and H. H. Haldaway, president of the company, is in the East to purchase additional equipment.

The Commercial Iron Works, 481 Fifth street, San Francisco, is taking figures on a lot of contractors' equipment, including 34 miles of light rails, 25 dump cars, one steam shovel, a small locomotive, steam roller, etc.

A representative of the Hunt Engineering Company, Kansas City, Mo., is investigating the property of the Old Mission Portland Cement Company, near Hollister, Cal., with a view to completing the plant.

The Pacific Northwest

SEATTLE, WASH., September 15, 1914.

That conditions in manufacturing lines in Seattle are good is evidenced by that fact that local banks report that the wage earners are banking their savings. Deposits have increased in a remarkable manner since the beginning of the war. While this indicates an abundance of money it also shows that the small depositor prefers to accumulate his funds and draw interest, rather than venture into a larger enterprise.

The Pacific Iron Works, Portland, Ore., has completed plans for its plant to be built at the end of Clackamas street, and construction bids are now being received. The buildings will be of reinforced concrete and will consist of a foundry and machine shop, a structural steel shop, a steel storage building, etc.

The Vilter Mfg. Company, Milwaukee, Wis., manufacturer of ice machinery, etc., has announced its intention of building a branch factory in Seattle, to cost $45,000. Jacob Duttonhoefer, Port Townsend, Wash., consulting engineer and the company's Northwest representative, will have charge. The factory will be two stories, of brick and concrete. It will become the distributing point for the Pacific coast.

The Speel River Power Company, Juneau, Alaska, which is connected with the Speel River Electric Chemical Company, will shortly begin the construction of a hydroelectric power plant and chemical works on the Speel River, near Juneau. E. P. Kennedy, Hotel Washington, Seattle, is president.

The Pacific Coast Pipe Company, Seattle, has been granted a permit for an addition to its plant.

The Northwest Electric & Water Company, Montesano, Wash., is making plans for improvements to its power system, including improvements and extensions to the power plant. Plans for the work are now under way.

Dunkitt Brothers, Plummer, Idaho, have been granted a certificate of public convenience and necessity by the state public service commission, and will begin construction work on an electrical generating plant.

The city clerk, Whitefish, Mont., will receive bids for furnishing materials and installing an electric lighting system.

The damage by fire to the plant of the St. Paul & Tacoma Lumber Company, Tacoma, which amounted to about $20,000, will be immediately repaired.

The factory of the Lake Union Box Company, 1901 Eastlake street, Seattle, was destroyed by fire with a loss of $6000. Otto Vetter, 2812 Boylston avenue, the owner, states he will rebuild.

The city of Medicine Lake, Mont., has voted a bond issue to cover the cost of installing a waterworks system.

Shoshone, Idaho, has voted $18,000 of bonds for the purchase and improvement of the waterworks.

Western Canada

WINNIPEG, MAN., September 18, 1914.

It is announced that the Dominion Shipbuilding & Drydock Company, of North Vancouver, B. C., has secured a site of 140 acres at Lynn Creek, B. C., and will construct a plant to cost $5,000,000. Machine shops will be built first.

The Steel Company of Canada, Ft. William, Ont., which started to erect a plant last year, and did not complete it on account of the dull season, has resumed building operations. J. O. Callahan is general manager.

Vernon, B. C., will soon commence the construction of a sewage disposal works.

The Canadian Electric Shoe Shining Machine Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of $100,000 by J. V. Anderson, C. W. Douglas, C. P. Springer, and others.

The Columbia Grain Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of $40,000 by L. J. Halilgrimson, H. J. Lindal, H. N. Hannesson, and others, to manufacture and deal in grain and flour.

The Colonial Brewing Company, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $400,000 by Robie L. Reid, David S. Wallbridge, James B. Boyd, and others, to build and operate brewing and refrigerating plants.

The Fernridge Lumber Company, New Westminster, B. C., whose plant was recently destroyed by fire, will rebuild. C. W. Tait, Columbia street, New Westminster, B. C., is managing director.

The mill of the Canadian Pacific Lumber Company, Port Moody, B. C., was destroyed by fire with a loss of $40,000.

Eastern Canada

TORONTO, ONT., September 19, 1914.

Large additions will be made to the Ross Rifle factory at Quebec, Que., in the near future. The present capacity of the plant is 200 rifles per day, but a larger output is required at once. A greater supply of ammunition is also needed.

H. J. Glaubitz, engineer of the municipal waterworks plant, London, Ont., is in the market for two waterwheels, turbines, pumps and motors.

The City Council, Toronto, has adopted a scheme for the construction of three or four incinerator plants in different parts of the city to cost $480,000. Tenders will be called as soon as plans are completed.

The International Fireworks Company, Schenectady, N. Y., has decided to establish a branch factory at London, Ont.

The sawmill of B. F. Smith, Florenceville, N. B., was destroyed by fire.

The town of Joliette, Que., will make improvements to its waterworks plant to cost $50,000. Improvements to the power plant will include two hydraulic pumps with a capacity of 1000 gal. per min. at 130 lb. pressure and a turbine.

The factory of the Niagara Spray Company, Aberdeen street, Kentville, N. S., which was destroyed by fire, with a loss of $13,000, will be rebuilt.

The Ecethermal Stove Company, Warren, Ohio, is erecting a factory at Kingsville, Ont., and will purchase equipment for manufacturing stoves, to cost $15,000. F. S. Thomas is president.

The Gutta Percha Rubber Company, Toronto, has been granted a permit for the erection of a $100,000 factory on West Lodge avenue. The building will be three stories, of steel and brick construction. Construction of the plant will not be started for some time. Sproat & Rolph, 36 North street, Toronto, is the architect.

The plant of the Marshall Iron Foundry, Windsor, Ont., was recently destroyed by fire.

The Morrisburg & Ottawa Construction Company, Ltd., Ottawa, Ont., has been incorporated with a capital stock of $40,000 by Allan J. Fraser, Martin J. Brennen, George D. Mumford, and others.

The Canadian Shipbuilding & Drydock Company, Ltd., Owen Sound, Ont., has been incorporated with a capital stock of $2,000,000 by Thomas H. Barton, Charles B. Henderson, Stanley C. S. Herr, and others, of Toronto, to build drydocks, vessels, etc.

The Warwick Wheel Company of Canada, Ltd., London, Ont., has been incorporated with a capital stock of $100,000 by Donald Ferguson, Charles W. Summers, James Brooks, and others, of London, Ont., to manufacture wheels, springs, tires, etc.

The Remington Arms Company, Ilion, N. Y., has completed plans for an addition to its plant at Windsor, Ont.

The Safety Tire Company, Ltd., Quebec, Que., has been incorporated with a capital stock of $1,000,000 by Joseph G. Frenette, Arthur Moisan, Ernest Taschereau, and others, to manufacture wheel rims, tires, wheels, etc.

The International Petroleum Company, Ltd., Toronto, has been incorporated with a capital stock of $20,000,000 by Andrew M. Stewart, James B. Taylor, and others, to manufacture and refine petroleum, etc., and to manufacture appliances, implements, machinery, etc., in any way connected with the operations of the company.

W. H. Taylor, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Neil F. MacNeil, Z. A. P. Cameron, R. S. McGillivray, and others, to build steamships, motor cars and locomotives, etc.

The Laing Boat Company, Ltd., Lachine, Que., has been incorporated with a capital stock of $20,000 to build boats, etc.

The Waterloo Iron Works, Ltd., Waterloo, Que., has been incorporated with a capital stock of $99,000 to manufacture iron, steel, etc.

The ratepayers of Goderich, Ont., have passed a by-law to guarantee the bonds of the Goderich Furniture Company to the extent of $25,000. In return the company will build a factory. The building operations will be started at once.

The Noble Air Pump Company, Ltd., Toronto, Ont., has been incorporated with a capital stock of $25,000 by John Noble, W. Bindon, J. R. Currie, and others, to manufacture automobile pumps and accessories for automobiles.

Government Purchases

WASHINGTON, D. C., September 21, 1914.

The following bids were received September 12 by the chief of the bureau of yards and docks, Navy Department, Washington, D. C., for furnishing four 15-ton locomotive cranes at the navy yards, Philadelphia, Pa., and Charleston, S. C.:

Item one, price for cranes, complete; two, price for furnishing standard double-truck cranes differing from specifications.

Orton & Steinbrenner Company—Item 2, $23,812.

The Ohio Locomotive Crane Company—Item 2, $23,922.

The Industrial Works—Item 2, $25,000.

The McMyler Interstate Company—Item 2, $25,160.

The Brown Hoisting Machine Company—Item 2, $26,990.

The Exeter Machine Works—Item 1, $25,260.

The Browning Company—Item 2, $23,995.

The Link Belt Company—Item 1, $25,136; 2, $23,800.

The American Hoist & Derrick Company—Item 2, $30,078.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, September 15, for supplies for the navy yards as follows:

Schedule 7174, Steam Engineering

Class 1, Puget Sound—One hydraulic riveting machine—Bid 21, $4106; 39, $2580; 136, $3735 and $2200; 159, $3245; 199, $4050, $4500, and $4070; 229, $2690 and $3622.

Alternate, Bid B—F. o. b. cars—Bid 21, $3235; 136, $3000 and $1800; 159, $2745; 199, $3300, $3740, and $3355; 229, $2270 and $2900.

Class 2, Puget Sound—One radial drill—Bid 136, $2000 and $1980; 159, $2320.

Alternate, Bid B—F. o. b. cars—Bid 136, $1870 and $1800; 159, $2175.

Class 3, Puget Sound—One punch and shear—Bid 97, $2460; 105, $2852.50; 111, $3672; 136, $1775.

Alternate, Bid B—F. o. b. cars—Bid 97, $2060; 105, $2387.50; 111, $3157; 136, $1550; 216, $3000; 238, $2500 and $3185.

The names of the bidders and the number under which they are designated above are as follows: 21, Bethlehem Steel Company; 39, Camden Iron Works; 97, Halliday Machinery Company; 105, Huntington Machine & Foundry Company; 111, Hilles & Jones Company; 136, Manning, Maxwell & Moore; 159, Niles-Bement-Pond Company; 199, William Sellers & Co.; 216, Toledo Machine & Tool Company; 229, William H. Wood; 238, William White Company.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until October 20, schedule 7357, one shearing machine for Annapolis; schedule 7358, three electric hoists for New York; until October 27, schedule 7360, three marine water-tube boilers, and schedule 7361, miscellaneous air pumps, all for Boston.

Oxidized Finish for Sheets

In the ordinary oxidation of iron or steel sheets by air, a deeply oxidized, hard light blue finish is secured which is said to be not always uniform throughout the surface, while ordinary oxidation by steam results in a superficially oxidized soft and dark blue finish. A patent (1,105,251, July 28, 1914), granted to John E. Carnahan, Canton, Ohio, has as its object the giving of such sheets a deeply oxidized hard and uniform dark blue finish. The new process consists in heating the sheets in an annealing box to an annealing heat and then separately exposing the heated sheets to the air. They are then again heated in an annealing box to a dark red temperature not sufficiently high to decompose the air-formed oxidation on them, after which they are permitted to cool while in the annealing box, steam being introduced into the box while they are both being heated and cooled. It is claimed that this further oxidation by the steam not only darkens the blue color but renders it uniform and that it serves to soften any excessive hardness from the previous oxidation.